

Human Capital and Productivity In British Columbia

A PRODUCTIVITY DISCUSSION PAPER

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Executive Summary

In most respects, British Columbia is performing extremely well in human capital development. The province's performance is above average according to the majority of the indicators we analyze, relative to both the rest of Canada and other OECD countries.

However, there is room for improvement. We have identified four key areas in which improvements would be likely to contribute to productivity growth in British Columbia: the underutilization of the skills of recent immigrants; the poor educational outcomes of Aboriginal people; the below-average production of advanced human capital through graduate training; and the problem of high school non-completion.

Recent immigrants are well educated relative to the general population, but their labour market outcomes are sub-par. Existing policies in Canada admit immigrants on the basis of their education and work experience with no assessment of the degree to which that education and experience will be valued in the labour market. Additionally, the onus is on the immigrants to find the relevant professional regulatory bodies in order to determine the acceptability of foreign credentials. There is room for improvement in this policy framework. The following are worth exploring:

- Admission via the federal Skilled Worker Program should be more focused on what is valued by Canadian employers. The program uses a 100 point scale to select permanent residents based on: education (up to 25 points), knowledge of English and/or French (24 points), experience (21 points), age (10 points), arranged employment (10 points), and adaptability (10 points).
 - o Of the 24 points available for language skills, up to 16 are awarded for fluency in one official language and up to eight are awarded for fluency in the other. The program does not select immigrants for Quebec and research suggests knowledge of English is a significant determinant of immigrant labour market outcomes in Canada while knowledge of multiple languages is not. Some or all of the eight points available for an additional official language should be reallocated to the first.
 - o Foreign work experience is of little to no value in the Canadian labour market yet all 21 "experience" points can be awarded for foreign work experience with only an additional five points under the "adaptability" category awarded for Canadian experience. Points should be removed from the experience category and added to the language category.
 - o Further, BC's Provincial Nominee Program should be allowed to grow such that half of those entering BC as skilled workers come through the provincial system.
- The provincial government should establish a formal credential recognition framework; create a single, recognized body to oversee assessments; and use its authority over the province's occupational regulatory organizations to ensure that credential assessments are respected by employers. This may involve the construction of sector-specific databases of international educational institutions, as recommended by the Business Council (2006b). The federal government should strongly encourage prospective immigrants to undergo an assessment early in the immigration process.

The educational outcomes of Aboriginal people are very poor relative to those of non-Aboriginals in Canada, and this education gap contributes to a severe labour market outcomes gap. While British Columbia performs better than average in this respect, the outcomes gaps for Aboriginals in the province are still unacceptably large. Hard work by Aboriginal students and the many people that support them is paying off. However, from an outside perspective, what is still missing is ongoing, consistent, rigorous analysis to identify what is helping Aboriginal students improve their education outcomes in successful districts and what barriers remain in other districts.

- For *off-reserve schools*, we suggest a new, independent group be established to provide this missing research and communicate the results. Funding could be provided by one or any combination of: a leading Aboriginal organization or a collection of individual First Nations, the BC Government and Aboriginal Affairs and Northern Development Canada (AANDC). Financial support from all involved would be ideal but this group could be established by any one organization. The work of a small professional staff would be directed by an independent, volunteer board chosen by the funding organizations and drawn from those involved in Aboriginal education.
- As outlined in more detail by others, we suggest federal funding for Community Education Authorities (CEAs) be structured so as to provide a strong incentive for bands to establish reasonably large CEAs for *on-reserve schools*. We agree with Richards and Scott (2009) that the federal government should provide per-student funding increases of at least 25 percent to schools that organize under school authorities of at least 12 schools. Of course, any such inducement would have to be negotiated by the federal government and the representatives of British Columbia First Nations.

Research suggests a marginal increase in the population with higher education has a larger effect on a country's total factor productivity growth the closer the economy is to the world technology frontier. As Canada is very close to this frontier returns to higher education in Canada remain high. Although British Columbia is above the Canadian average in terms of the proportion of the population having attained a graduate degree, investment in increasing that proportion would likely yield significant economic benefits for the province. To that end we suggest that:

- Funding at British Columbian universities should be reallocated to promote greater enrolments in graduate programs. A reasonable policy goal for BC is to reach 4.0 percent of the population aged 18-29 by 2020. Achieving this would require growth at twice the pace seen in BC between 2000 and 2008.
- The government and universities develop a comprehensive graduate student fellowship program, similar to those available in Quebec and Ontario. This can help attract more international students, encourage British Columbian students to pursue graduate studies, and increase the research output of British Columbia's universities.

High school non-completers face significant economic challenges and contribute less to the economy on average than they would if they had completed high school. According to Labour Force data, over half of those who do not complete their K-12 education in six years from the grade eight starting point either get a certificate through their own effort, take a little longer to complete in the public system or find another path to completion. This still leaves a large number of young people with poor employment prospects, therefore:

- We suggest the province develop a new indicator which can, to the extent possible, track all paths to completion. Creating an "Overall Completion Rate" indicator will be a significant challenge but it is necessary if BC is to realize the goal of being the best-educated, most literate place in North America. Without such a measure we cannot identify groups of people with unmet needs and develop programs to fill these needs. Simply looking for improvements in the six-year completion rate is likely to lead to wasted resources and missed opportunities; and that,
- Policymakers aspire to continuously increase the overall completion rate; that is, to set a target drop-out rate of zero percent. This would obviously be a 'soft target,' since it is unrealistic to suppose that it will ever be reached (and further reductions would surely become uneconomical beyond some high completion rate). However, the goal of 100 percent completion would help ensure that those students who still cannot graduate are identified and offered assistance appropriate to their needs and circumstances.

Further, to focus on drop-outs we suggest the provincial government:

- Invest in the production of better information about the personal and family characteristics of high school drop-outs in British Columbia, as well as evidence on the school- and district-level factors associated with non-completion. A study modeled after Government of Alberta (2009) would be a good starting point. Such information could be used in conjunction with FSA scores to identify potential drop-outs at a young age and to further develop and refine programs to help them graduate; and,
- Report ratios of performing and underperforming students by district and, provide a provincial summary for those who are underperforming showing: the grade in which performance issues were identified; what interventions have been tried; and, whether or not the person is still in school.

I. Introduction

In 2007, the BC Progress Board identified British Columbia's lagging productivity growth as a major concern for both the public and private sectors. The Board commissioned the Centre for the Study of Living Standards (CSLS) to write a report on productivity drivers in British Columbia and to suggest strategic areas for improvement (Sharpe and Arsenault, 2008). The report identified five areas for improvement: investment, education, innovation, resource reallocation, and trade and migration. The CSLS subsequently produced a report on investment in British Columbia (Sharpe, Arsenault and Harrison, 2009). The present report examines a second strategic area: education, or human capital.¹

In most respects, British Columbia is performing extremely well in human capital development. The province's performance is above average according to the majority of the indicators we have analyzed. Relative to both the rest of Canada and other OECD countries, British Columbia is a leader in human capital development. However, there is room for improvement. We have identified four key areas in which improvements would be likely to contribute to productivity growth in British Columbia: the underutilization of the skills of recent immigrants; the poor educational outcomes of Aboriginal people; the below-average production of advanced human capital through graduate training; and the problem of high school non-completion.

Because the topic of human capital is vast, a comprehensive description and assessment of human capital development in British Columbia would necessitate a lengthy and dense report.² In order to avoid this, we have opted to focus on the four key areas for improvement. Other aspects of human capital development receive less detailed treatment in the main text of the report; since British Columbia does well in those areas, there is no need to discuss them at length. That said, we do provide a lengthy set of appendices in which interested readers can find more detailed information on a variety of aspects of human capital development in British Columbia.

The body of the report contains seven sections including this introduction. In Section II, we discuss how human capital is measured and what is known about its effects on productivity and other economic outcomes. Section III contains an overview of human capital infrastructure in British Columbia, while Section IV presents an analysis of the province's human capital development outcomes. In Section V, we discuss two populations with unique human capital challenges: recent immigrants and Aboriginal people. In Section VI, we provide policy recommendations relevant to each of the four areas for improvement. Section VII concludes.³

II. Human Capital: Definition, Measurement, and Impact

This report defines human capital as the stock of knowledge, skills, and abilities embodied in individuals that determines their level of productivity. In principle it includes both innate abilities and skills acquired through education and experience. The report focuses on acquirable skills, since they are amenable to policy intervention.

Human capital is not directly measurable, so one must use proxies to quantify it. The most common proxies for human capital are measures of educational attainment. Such measures include the highest level of education obtained and the number of years of schooling. It is assumed that the more formal education a person experiences, the more human capital he or she will accumulate.

On a macro level, it is also common to measure the economy's human capital by the rates of enrolment in elementary and secondary schools and in post-secondary institutions. It is assumed that high enrolment rates in education and training institutions indicate that more people are accumulating human capital and that the workforce, as a whole, is becoming more productive. Indeed, countries with high enrollment rates in education and training institutions tend to enjoy higher productivity, higher living standards, and faster economic growth (Mankiw et al., 1992).

As proxies for human capital, measures of educational attainment are not without flaws. Neither the number of years of schooling nor the highest level of education obtained provides information about the quality of the education received by an individual. This particular aspect of human capital measurement is being dealt with (at least for young adults) by directly testing their competency levels in such key subjects as reading, problem solving, mathematics, and science. The OECD has created the International Adult Literacy Survey (IALS) and the Program for International Student Assessment (PISA) for this purpose.

Until recently, there was a lingering debate in economics concerning what form of human capital was captured by these proxies. Did educational attainment measure acquired skills or innate abilities? The signaling (or screening) theory suggested that educational attainment might simply be a signal that individuals use to inform employers about their innate abilities, and that educational attainment may not directly improve individuals' productivity (Spence, 1973).

Recent evidence, however, suggests that education does in fact increase productivity by improving individuals' skills. There is a strong and well-established positive relationship between educational attainment and labour earnings, which reflect productivity (Riddell 2007a). A simple correlation does not rule out the possibility that education captures the impact of an unobserved omitted variable, such as innate ability, but a large number of studies have used 'natural experiments' to

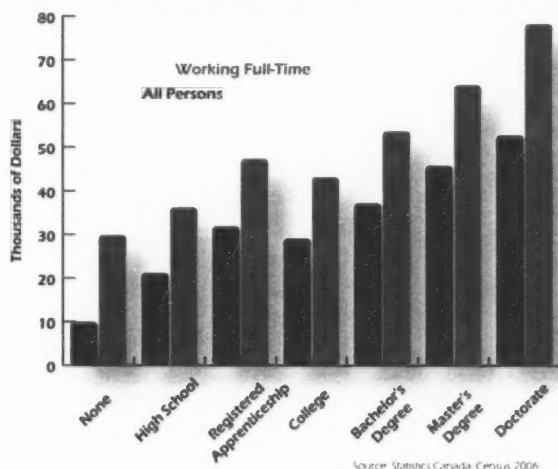
circumvent this problem.⁴ These studies provide strong evidence that policy interventions that raised the educational attainment of certain groups in the past had large positive effects on the subsequent lifetime earnings of those individuals.

This recent body of research gives rise to two key conclusions. First, rates of return to investments in education are high – and possibly higher than what was implied by earlier research. Second, policy interventions that result in additional schooling being acquired by individuals from disadvantaged backgrounds, or those who face other barriers to acquiring human capital, may yield substantial returns in the form of enhanced productivity, in addition to contributing to equity objectives (Riddell, 2007a).

Figure 1 illustrates the strong positive relationship between educational attainment and employment earnings in British Columbia. Among persons who worked mostly full-time in 2005 and who did not have a high school certificate, average employment income was \$29,657. High school graduation raised annual earnings by over \$6,000 to \$36,006. At the other end of the spectrum, average earnings among full-time workers with a master's degree or a PhD were \$64,018 and \$77,983, respectively. Since wages reflect productivity, these data illustrate the importance of education for productivity in British Columbia.

The education-earnings relationship is even stronger when the total population aged 15 and above is considered, rather than just those who worked full-time. This is attributable to the high unemployment rates and low employment rates among those with the least education (see Appendix 1).

Figure 1: Average Employment Income in BC, 2005



III. Human Capital Infrastructure in British Columbia

Human capital infrastructure refers to the policy and physical apparatuses that underlie the production of human capital in the province. This includes the physical capacity of the education system as well as the policies supporting education in the province. We also examine enrolments, which measure the degree to which the system's capacity is utilized.

A. Investment and Capital Stock in Educational Services

A major component of human capital infrastructure is the physical infrastructure used in human capital formation. For Canada and the provinces, Statistics Canada provides measures of physical capital investment and the capital stock in the educational services industry. Physical capital in educational services includes the actual structures in which the services are delivered – elementary and secondary school buildings, university and college buildings, and so on – as well as any machines, equipment, and software used in the delivery of the services. Thus, measures of the capital stock give an indication of the total physical capacity of the educational services industry, while measures of investment indicate the degree to which interested stakeholders (mainly governments) are investing in expanding that capacity.

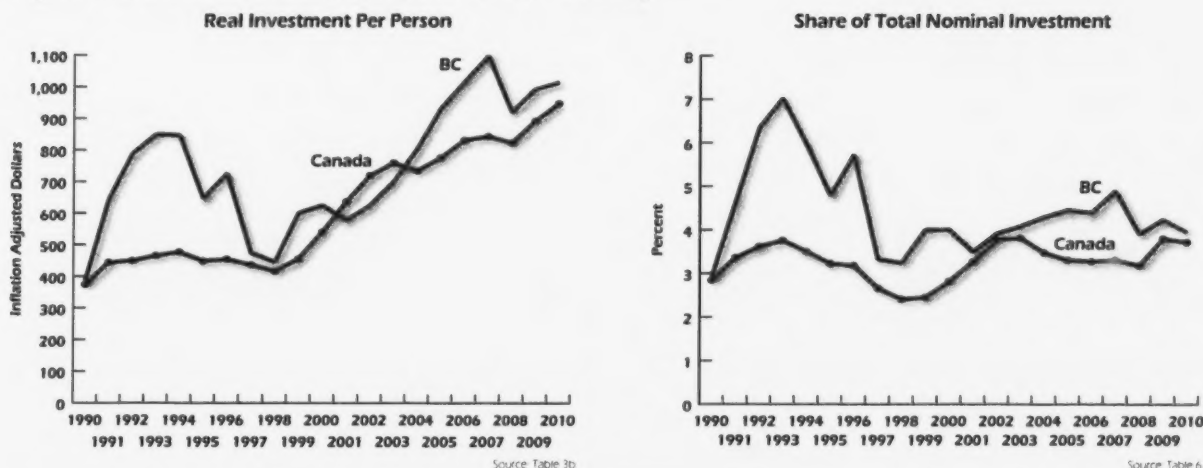
British Columbia's investment performance in the educational services industry has been better than the Canada-wide average over the 1990-2010 period, in terms of both real investment per person aged 5-24 and educational services investment as a share of total economy investment (Figure 2). In 2010, educational investment per person aged 5-24 was \$1,013 in British Columbia, versus \$947 in Canada. The educational services industry accounted for 3.95 percent of total investment in British Columbia, compared to 3.72 percent in Canada.

As a result of its strong investment performance, British Columbia's educational capital stock per person aged 5-24 has consistently been above average. Since 1993, the value of the capital stock in educational services, per person aged 5-24, has been greater in British Columbia than in Canada as a whole (Table 5b). The real capital stock increased 3.52 percent per year in British Columbia over 1990-2010, compared to 2.23 percent per year in Canada.

B. Government Expenditure on Education

Public expenditure on education is another indicator of the educational resources being provided to students. In per-student terms, British Columbia's public spending on education is above

Figure 2: Investment in the Educational Services Industry

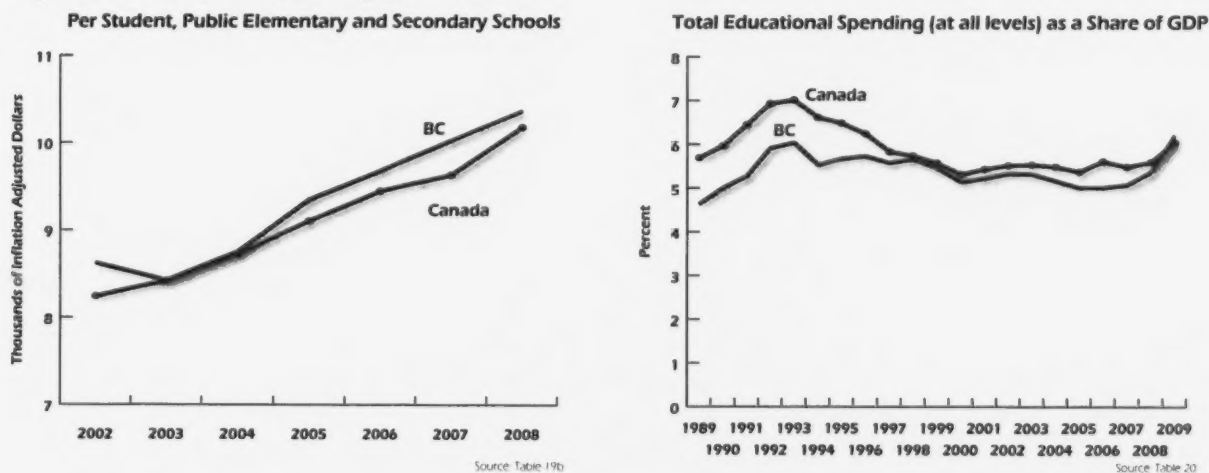


Note: 'Per person' means 'per person between the ages of 5 and 24.' We use this age group as an approximation of the 'target population' of educational investment.

average at the elementary and secondary levels and at the post-secondary level. Per-student spending in 2008 in public elementary and secondary schools was \$10,363 in British Columbia (in 2002 constant dollars), ahead of the Canadian average (\$10,179) and third highest among the provinces (Table 19b and Figure 3). At the post-secondary level, British Columbia's public spending was \$19,610 in 2006 (in current dollars) – above the national average of \$18,852 per student, but behind six provinces (Table 23b).

British Columbia committed 6.2 percent of GDP to education in 2009, just above the Canadian average of 6.0 percent (Figure 3). British Columbia's ratio was below average prior to 2009. These figures include all spending on primary, secondary and post-secondary education. British Columbia's education spending as a share of GDP was fifth lowest among the ten provinces.

Figure 3: Government Spending on Education

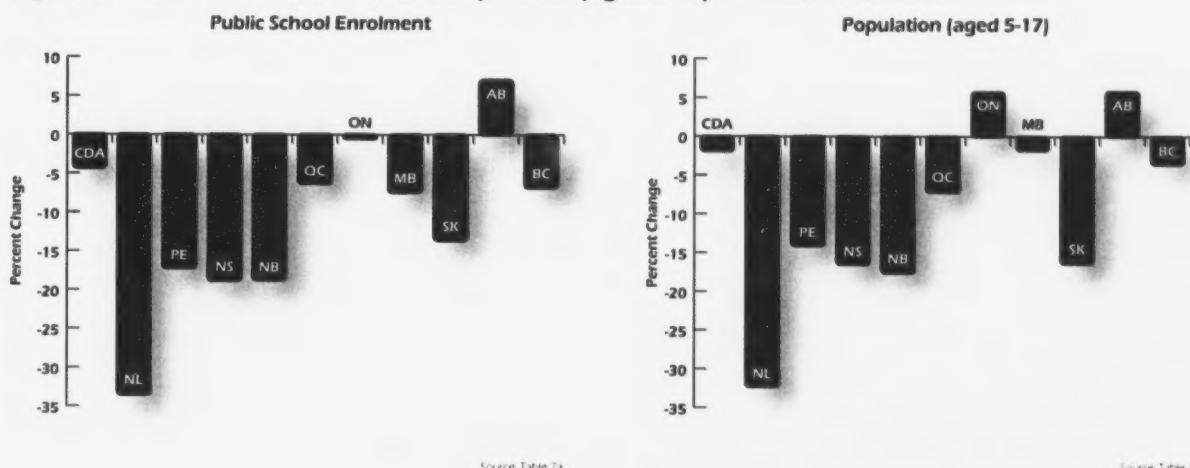


The fact that British Columbia achieves high public school per-student educational spending even when its spending relative to GDP is usually below average may reflect the large proportion of British Columbia students who attend independent schools. We do not have independent schooling data that are comparable across provinces, but our correspondence with stakeholders suggests that independent school students make up an above average share of all primary and secondary school students in British Columbia. Given that per-student spending in public schools is well above average, the relatively low share of GDP going to education is not a problem. The province's school system is well-supported by public funding.

C. Elementary and Secondary School Enrolments

The number of students enrolled in British Columbia's public elementary and secondary schools decreased from 607,644 in 1996 to 566,048 in 2008 (Table 7a).⁵ This downward trend in enrolments is not specific to British Columbia. Enrolments declined in every province except Alberta over the 1996-2008 period. The enrolment declines correspond to declines in the school-age population (that is, the population aged 5-17). Figure 4 illustrates this correspondence.

Figure 4: Public School Enrolment and Population (aged 5-17) Growth, 1996-2008



Source: Table 7a

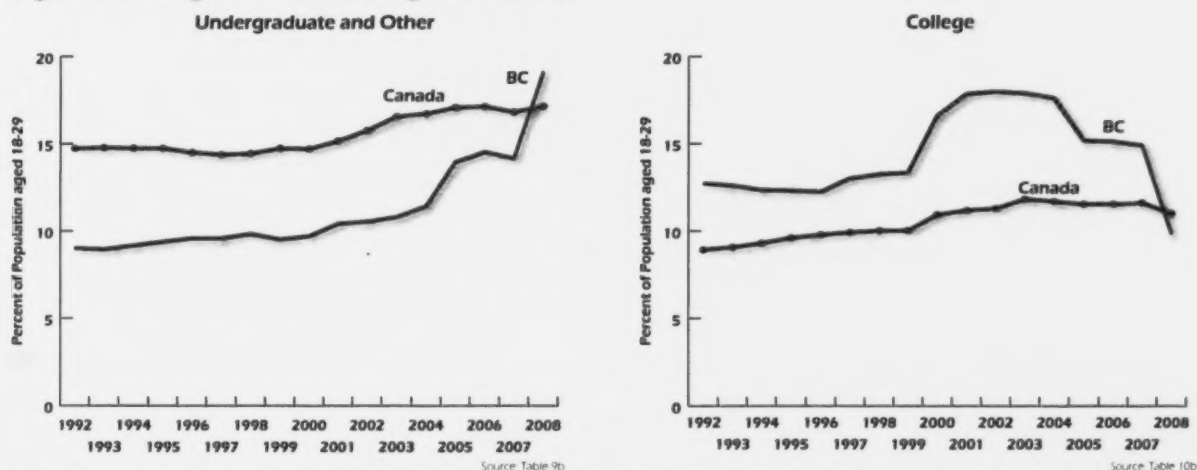
Source: Table 7b

In British Columbia, public school enrolments declined by 6.85 percent over the 1996-2008 period while the school-age population fell by only 3.62 percent. The difference is almost entirely accounted for by the increase in independent school enrolments over the period. According to data from the Federation of Independent School Associations (FISA), independent school enrolments in British Columbia increased 23.4 percent from 55,866 in 1996 to 68,919 in 2008 (Table 7c). Using FISA's numbers in combination with the school-age population data from Statistics Canada, a crude estimate of British Columbia's enrolment rate for 2008 is 99 percent. Although this is down slightly from an estimated 100 percent in 1996, it is still essentially the total school-age population.

D. Post-Secondary Enrolments

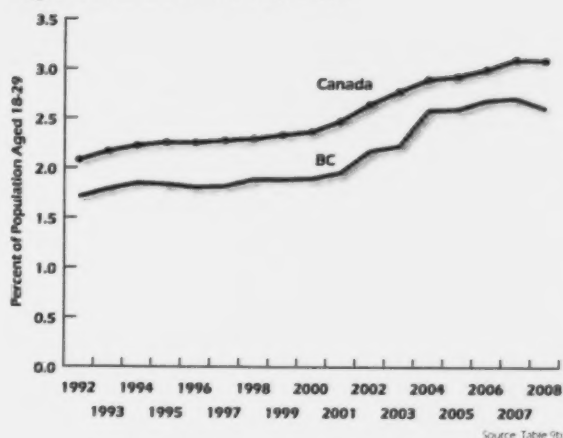
British Columbia's university undergraduate enrolments as a proportion of the population aged 18-29 were below the Canadian average until 2008, when a number of colleges became universities (Table 9a and Figure 5). However, British Columbia's shortfall was largely offset in the 1990s and more than offset in the 2000s by its above average college enrolment rate (Table 10b). The combined undergraduate and other and college enrolment rate for 2008 was 29.0 percent in British Columbia, slightly above the Canadian average of 28.2 percent. British Columbia has a well-developed college-to-university transfer program, which allows students to transfer to an undergraduate program after beginning their post-secondary education in a college (Gaber, 2005). The province's historically low university undergraduate enrolment rate was never a cause for concern.

Figure 5: Undergraduate and College Enrolments



One area that the data reveal as a potential area for improvement is graduate-level university enrolment, which focuses on students who continue their education beyond the bachelor level. British Columbia's graduate-level university enrolment rate is below the Canadian average. In 2008, the proportion of the population aged 18-29 enrolled in graduate studies was 2.6 percent in British Columbia, compared to 3.1 percent in Canada (Table 9b and Figure 6). The gap persisted at about half a percentage point throughout the 1992-2008 period. Unlike low undergraduate enrolments, low graduate school enrolments cannot be offset by high college enrolments. Given the importance of advanced human capital as a driver of innovation, increasing the graduate enrolment rate is a worthwhile policy goal. We discuss this further in Section VI below.

Figure 6: Graduate Enrolment



The enrolment rate in registered apprenticeship training was below the Canadian average between 1992 and 2006, but surpassed it in 2007. In 2008, 7.4 percent of the population aged 18-29 was enrolled in apprenticeship training in British Columbia, versus 7.1 percent in Canada (Table 11b).

E. Supportive Elements

In addition to primary, secondary and post-secondary schools, British Columbia has a variety of programs designed to support human capital development in targeted population groups. These include early childhood education (ECE), adult education, and English as a second language (ESL) training.

I. EARLY CHILDHOOD EDUCATION

The major ECE program in British Columbia is StrongStart BC. The provincial government has established StrongStart early learning centres in schools across British Columbia. As of April 14th, 2011, there were 310 centres operating in British Columbia.⁶ The centres provide spaces for parents (or caregivers) and children from birth to five years of age to participate in learning activities together under the guidance of licensed early childhood educators.

It is too early for StrongStart to have had an impact on participants' educational attainment levels or labour market outcomes, so there are no evaluations of the program's direct impacts. Two studies have evaluated StrongStart based on the views of participating parents and caregivers (Human Early Learning Partnership, 2008; 2009). Both studies found that the program was very highly valued by participants. Parents were able to identify positive learning outcomes in their children as well as changes in their home activities with the children. Parents in rural areas were particularly enthusiastic about the program.

For a comprehensive overview of British Columbia's early childhood education system, see Kershaw et al. (2009).

II. ADULT EDUCATION

Within its Adult Opportunities Action Plan, the Government of British Columbia has developed programs to meet the needs of adults who are not ready to enter directly into an academic or career program at the post-secondary level. The Adult Basic Education (ABE) programs provide tuition-free courses for adults who did not finish high school or who wish to take additional courses to improve their skills. The Adult Special Education (ASE) programs were created to help persons with permanent disabilities succeed in their efforts to obtain post-secondary education. Students admitted to a public post-secondary program have access to special arrangements such as note-takers, readers, interpreters, separate locations and extra time for exams, parking, etc. They also have access to special equipment such as audio books, large print books, computers with screen readers, etc.

Since the early 1990s, there have been several surveys designed to obtain information on the outcomes of ABE students. The latest of these surveys found that ABE students who completed the program were much more likely to pursue higher levels of education. As for employment, no clear positive outcomes were found for those students who took ABE fundamental courses.

So far, apparently, there has not been a systematic attempt to quantify the effectiveness of the ASE programs.

III. ENGLISH AS A SECOND LANGUAGE

The English as a Second Language programs are directed to new immigrants or refugees in British Columbia whose first language is not English. These programs deliver English lessons at the basic, intermediate, and advanced levels in order to ease newcomers' transition to life in British Columbia and to help them obtain employment. The Government of British Columbia reports that in 2008/09, 35 programs were delivered in 42 locations across British Columbia.

There have been several attempts to measure the effectiveness of the ESL programs. Data collection on the outcomes of ESL students goes as far back as 1996. The latest survey, that of 2010, covered former domestic ESL students who studied at the intermediate or higher level between the beginning of July 2006 and the end of June 2009. The interviews were conducted between January and March 2010, approximately six to 42 months after the respondents completed their formal ESL training. The survey found that ESL students were mostly females with a median age of 34. The majority of them are well educated recent immigrants from China, Iran and India. Their main reasons for enrolling in ESL training were to prepare for further study, improve their ability to use English in daily life, and to improve their employment situation. Overall, most respondents agree that the program helped improve their English skills in all four areas (reading, writing, speaking, and listening).

IV. Human Capital Outcomes in British Columbia

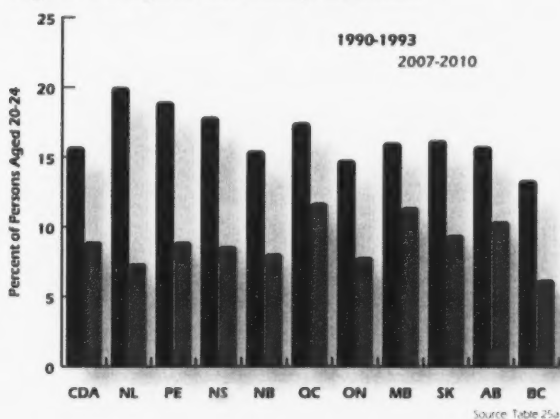
In this section, we assess British Columbia's human capital outcomes by comparing the province to other Canadian and international jurisdictions across a number of human capital indicators: educational attainment, literacy, and student performance on standardized tests. We place particular emphasis on high school non-completion, given its importance as a determinant of labour force participation and productivity.

A. Educational Attainment

I. HIGH SCHOOL

British Columbia is above the Canadian average in high school completion. In 2010, 91.1 percent of the population aged 25-64 had at least a high school certificate (Table 12b). The Canadian average was 88.4 percent, and no province had a higher rate of high school completion than British Columbia. Among OECD countries, only the Czech Republic (at 91 percent) had a high school completion rate higher than British Columbia in 2008 (Statistics Canada, 2010).

Figure 7: High School Drop-Out Rate



Given the importance of high school completion, the high school drop-out rate is a particularly important statistic. Statistics Canada defines the high school drop-out rate as the share of the population aged 20 to 24 with no high school diploma and not attending school. Under this definition, the high school drop-out rate in British Columbia was 6.2 percent over the 2007-2010 period (Table 25b). This was below the Canadian average drop-out rate of 8.9 percent and lowest among the provinces (Figure 7). According to OECD data reported by de Broucker (2005), British Columbia's 7.5 percent drop-out rate in 2002-

2005 was lower than that of every OECD country other than Norway (4.6 percent in 2003), the Slovak Republic (5.5 percent in 2002), and the Czech Republic (5.9 percent in 2002).

Although British Columbia's drop-out rate is low relative to Canada and other countries, it remains a key area for policy intervention. Even from the province's low starting point, further reductions

in non-completion would likely produce substantial benefits both for the non-completers themselves and for society as a whole because of the substantial return to high school completion (Riddell, 2007a). It is therefore worth examining the issue more closely.

Table 1 provides data on high school non-completers in British Columbia by demographic characteristics, based on the 2006 Census. (Note that a person is counted as a non-completer only if they have not completed high school or any post-secondary schooling.) The overall non-completion rate among 25-64 year olds is 12.3 percent. The rate is slightly higher among males than among females. The non-completion rate is particularly high among Aboriginal people (at 29.6 percent) and in rural areas (at 16.3 percent). It is particularly low among recent immigrants (at 9.9 percent), which reflects the screening of immigrants according to educational attainment. The outcomes of Aboriginals and recent immigrants are discussed in more depth in Section V below.

Table 1: Characteristics of High School Non-Completers in British Columbia, Population Aged 25-64, 2006			
	Percent of Total Population	Percent of Non-completers	Incidence of non-completion
Total	100.0	100.0	12.3
Females	51.4	48.0	11.5
Males	48.6	52.0	13.2
<i>Immigration Status</i>			
Immigrated within the last 5 years	4.5	3.6	9.9
Immigrated 5-10 years ago	4.7	4.0	10.8
Immigrated 10-20 years ago	7.7	9.2	14.9
Canadian born or immigrated over 20 years ago	83.2	83.2	12.5
<i>Minority Status</i>			
Visible Minority	23.9	26.2	13.5
Not a visible minority	76.1	73.8	12.0
<i>Aboriginal</i>			
Aboriginal Identity	4.2	10.0	29.6
Non-Aboriginal	95.8	90.0	11.6
<i>Location</i>			
Vancouver	52.8	44.2	10.3
Victoria	8.0	5.2	8.0
Non-CMA	31.8	42.0	16.3
Note: Incidence of non-completion is the proportion of the given subpopulation that has not completed high school or any post-secondary education.			
Source: Statistics Canada Census 2006, public use micro-data file.			

Unfortunately, the Census data does not allow one to identify the family characteristics of non-completers, although it is known that many high school drop-outs come from single-parent households with low socioeconomic backgrounds. Pagani et al. (2008) find that strong risk factors associated with high school non-completion include having a mother who did not finish high school, being from a single-parent family from early childhood, and having failed a grade in primary school. Students who experienced all three of these risk factors were "practically guaranteed" to drop out. Engaging in paid work while in high school is also a strong predictor of non-completion (Parent, 2006).

The Government of Alberta (2009) conducted a longitudinal study of Albertan students who entered Grade 3 in 1995 and entered Grade 10 in 2002. The results identify several factors that affect the probability of high school completion within three years of entering Grade 10. The completion probability is lower among students with high mobility (i.e. students who attended multiple schools throughout their educational career), as well as in schools in large jurisdictions, schools with a high proportion of lone-parent families, and schools in close proximity to colleges or economically expanding regions (i.e. the oil sands). Factors that increase the probability of on-time completion include academic achievement, family income, and maternal education.

These findings suggest that the decision to drop out of high school reflects both a lack of engagement with school and the availability of attractive outside options for students. The findings are likely to be relevant to the British Columbia context. According to the 2006 Census, for example, 3.6 percent of the population aged 18-64 had not completed high school but nevertheless had a trades or college certificate. The option of leaving high school in favour of college may be related to the Alberta finding that proximity to a college increases the non-completion probability; perhaps the option is more salient to people who live close to colleges. High school completion in British Columbia is also predicted by academic achievement earlier in the school career, as measured by scores on the Foundation Skills Assessment (FSA) test in Grade 4 and Grade 7. Table 2 shows the six-year high school completion rates for students at different levels of FSA achievement in the reading comprehension domain of the test. Students who exceeded expectations on the FSA went on to achieve six-year graduation rates of 99 or 100 percent, while completion rates were around 90 percent for those classified as meeting expectations. Completion rates were much lower among students who did not meet expectations, and sometimes below 50 percent for those whose performance level was unknown (i.e. persons who did not answer any questions).

It is important to identify potential drop-outs early in their school careers, and FSA scores are a powerful tool that can be used to do this. Once potential drop-outs are identified, interventions must be designed to help those students meet educational expectations. More evidence on the demographic and family characteristics of drop-outs would be desirable, as would more information on the school- and district-level characteristics associated with non-completion. Such information would help educators craft policies that meet the needs of each at-risk student.

Table 2: Six-Year High School Completion Rates by Reading Comprehension FSA Score

	<u>Grade 4 FSA</u>		<u>Grade 7 FSA</u>				
Year FSA was Taken	1999/00	2000/01	1999/00	2000/01	2001/02	2002/03	2003/04
Six-Year Completion Rate Year	2008/09	2009/10	2005/06	2006/07	2007/08	2008/09	2009/10
FSA Reading Attainment Level							
Performance level unknown	56	60	59	57	55	47	46
Does not meet expectations	68	71	66	71	68	70	69
Meets expectations	89	91	89	91	90	90	90
Exceeds expectations	99	100	99	100	100	100	100

Notes:

1. The six-year completion rate is the proportion of students who complete high school within six years, starting from their Grade 8 year. Thus, rates can be computed nine years after the FSA for students tested in Grade 4, and six years after the FSA for students tested in Grade 7.

2. The 'Performance level unknown' category contains students who did not answer any questions on the reading section of the FSA.

3. Completion rates are adjusted for outmigration.

Source: British Columbia Ministry of Education.

The British Columbia government has a role to play in collecting this information and making it publically available. Just as importantly, the provincial government should conduct thorough and well-designed evaluations of any policies that are implemented with the aim of preventing high school non-completion.

A final note: policymakers and researchers should study the quality of high school equivalency programs (i.e. the GED) as substitutes for a high school diploma. High school equivalency credentials are grouped with high school diplomas in Canadian statistics. There is evidence from the United States suggesting that people with GEDs perform no better in the labour market than high school drop-outs without GEDs (Heckman and LaFontaine, 2008). Is this true in British Columbia? If so, then the non-completion problem may be much larger than it seems.

II. POST-SECONDARY

In 2010, 60.7 percent of the population aged 25 to 64 in British Columbia had a post-secondary degree, certificate, or diploma (Table 13b). This was slightly below the Canadian average of 62.5 percent and fifth among the provinces (behind Quebec, Ontario, Nova Scotia and Alberta).⁷ This includes all credentials attained through colleges, trade schools and apprenticeships, and universities.

For a modern economy like Canada, a case can be made that the most important indicator of the quality of the labour force is the proportion of the population with a university degree. This is because economic progress in advanced economies depends on research and innovation, which are fostered by high-level human capital (Vandenbussche et al., 2006). In 2010, 28.0 percent of the population aged 25 to 64 in British Columbia had a university degree (Table 14b). This was above the national average of 26.4 percent. Among OECD countries, only five performed as well as or better than British Columbia in university degree attainment: Iceland (26 percent), Denmark (26 percent), the Netherlands (29 percent), the United States (31 percent), and Norway (32 percent).

In 2010, 9.1 percent of British Columbians aged 25 to 64 had a graduate degree (Table 15b). This was above the Canadian average of 8.3 percent, and ahead of every province but Ontario. The combination of a high graduate attainment rate and a low graduate enrolment rate (illustrated in Figure 6) is explained by the fact that British Columbia attracts well-educated people from outside the province (Turpin and Sager, 2009).

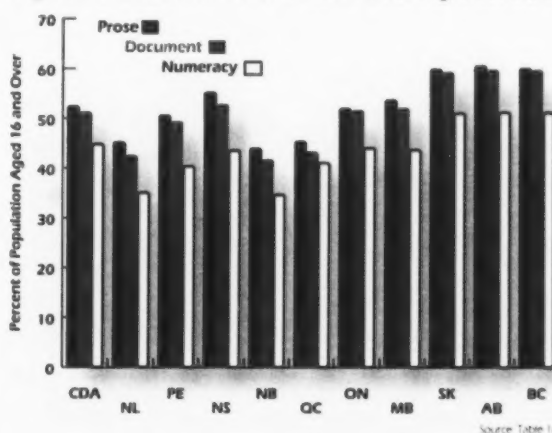
B. Scores on Skills Assessment Tests

Academic credentials do not necessarily imply that a person possesses skills and competencies that can be put to use in the labour market (Bonikowska et al., 2008). Results from literacy tests and skills assessments provide direct measures of persons' usable cognitive skills.

I. LITERACY

The 2003 International Adult Literacy and Skills Survey (IALSS) measures competencies across Canada in four domains: prose and document literacy, numeracy, and problem solving.⁸ The IALSS defines five competency levels and considers Level 3 (scores between 276 and 325) to be the minimum desirable level of literacy. In British Columbia, the percentage of the population aged 16 and over that met the desired literacy threshold was 60 percent in prose and document literacy and 51 percent in numeracy (Table 16 and Figure 8). Together with Alberta and Saskatchewan, British Columbia ranked first among the provinces according to these literacy indicators. The corresponding national averages were 52 percent in prose, 51 percent in document literacy, and 45 percent in numeracy.

Figure 8: Level Three or Above Literacy Scores, 2003



According to the IALSS, the literacy level of the adult population of British Columbia is higher than that of the adult population of the best performing countries in the world, including Norway and the United States (Statistics Canada, 2003).

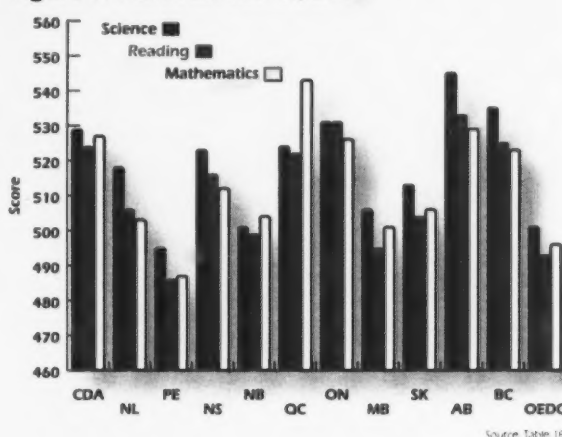
II. STUDENT PERFORMANCE

A. PROGRAM FOR INTERNATIONAL STUDENT ASSESSMENT

The OECD has developed the Program for International Student Assessment (PISA), an instrument that measures students' knowledge and skills in the key areas of science, reading, and mathematics. In 2009, British Columbia's average scores in science, reading, and mathematics were 535, 525 and 523, respectively (Table 18 and Figure 9). The province was above the national average in science (529) and reading (524). Among the 75 participating jurisdictions, British Columbia was bested by seven in reading and science (Statistics Canada, 2010b). In mathematics, British Columbia was slightly below the Canadian average of 527 and was bettered by 15 jurisdictions.

The average scores of 15-year old British Columbia residents in reading and mathematics were lower in 2006 and 2009 than in 2000 and 2003, but only the decline in mathematics (from 538 in 2003 to 523 in 2006 and 2009) was statistically significant. It is too early to know whether or not these small declines are indicative of long-term trends, but they are potential warning signs that are worth monitoring.

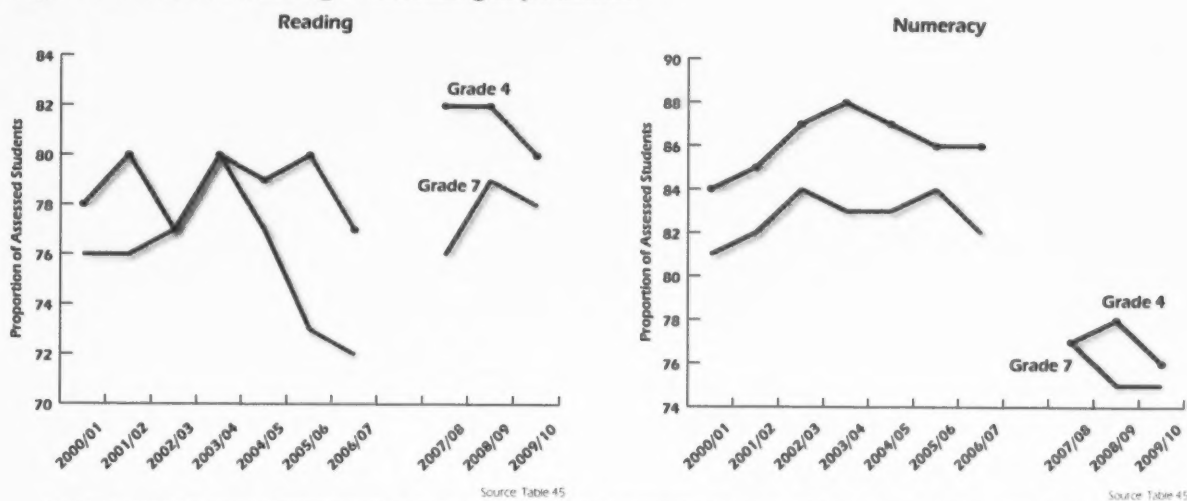
Figure 9: PISA Test Scores, 2009



B. FOUNDATION SKILLS ASSESSMENT

In British Columbia, a standardized Foundation Skills Assessment (FSA) test is administered annually to students in Grades 4 and 7 in public and provincially-funded independent schools. The test provides information about how well students in the province are learning key skills in three areas: reading comprehension, writing, and numeracy. In 2009, 80 percent of Grade 4 students and 78 percent of Grade 7 students met or exceeded expectations in reading comprehension (Figure 10). In that same year, 76 percent of Grade 4 students and 75 percent of Grade 7 students met or exceeded expectations in numeracy.

Figure 10: Students Meeting or Exceeding Expectations*



*Data from 2007/08 on are not directly comparable to earlier data. Prior to 2007/08 students listed under "Insufficient Information to Assess" were excluded from the number of assessed students used as the denominator.

The FSA is administered only in British Columbia, so comparisons with other jurisdictions are not possible. The methodology for calculating the meet-exceed ratio changed in 2007/08 so the two groups of years are not directly comparable.

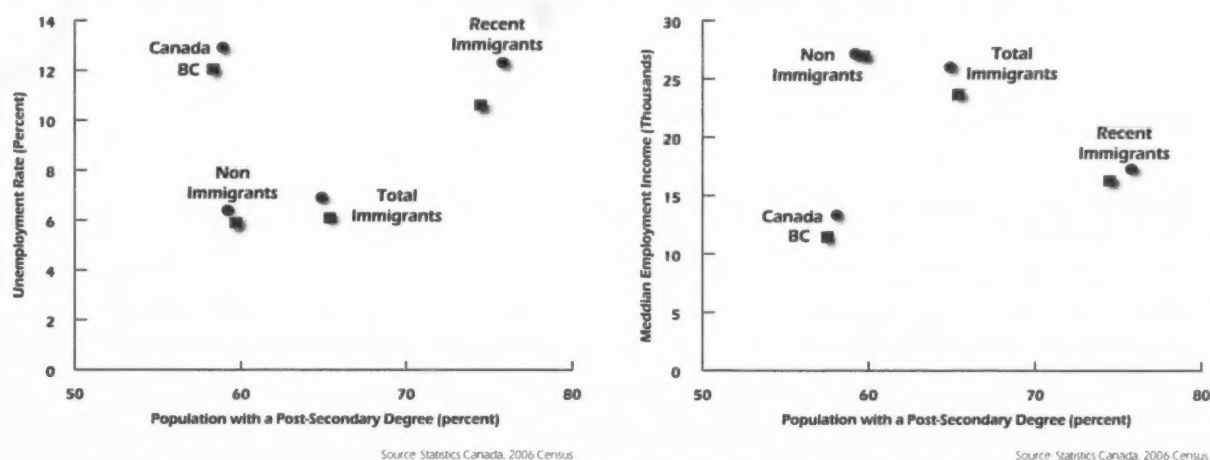
V. Populations with Unique Human Capital Challenges

Within Canada and British Columbia, there are subpopulations that differ significantly from the overall population in terms of educational outcomes and human capital development. Two particularly important groups in this regard are recent immigrants and Aboriginals. During the consultative phase of this project, almost all persons interviewed remarked on the importance of addressing the challenges faced by these two groups. In this section, we address each in turn.

A. Human Capital among Recent Immigrants

Immigrants are crucial for the future growth of the labour force in Canada and British Columbia, but their skills are being underutilized. Their human capital profile is paradoxical in the sense that they have both higher educational attainment and worse labour market outcomes than non-immigrant Canadians. This is especially true of recent immigrants – those who have been in Canada for fewer than five years. According to the 2006 Census, immigrants in British Columbia and Canada had higher rates of post-secondary educational attainment than non-immigrants but also higher unemployment rates and lower median employment incomes (Figure 11). Post-secondary educational attainment was 14.8 percentage points higher among recent immigrants than among non-immigrants in British Columbia (74.5 percent versus 59.7 percent), but the recent immigrant unemployment rate was 4.8 percentage points higher than that of non-immigrants (10.6 percent versus 5.9 percent) and recent immigrants' median annual employment incomes were 39.6 percent below the non-immigrant level (\$16,293 versus \$26,974).

Figure 11: Educational Attainment, Unemployment Rates and Median Employment Income



Note: The Census provides educational attainment data for 2006, but median employment income data for 2005. The years are close enough for the comparison to be meaningful. Employment income includes wages and salaries, net income from a non-farm unincorporated business or professional practice, and net farm self-employment income.

The outcomes gap between non-immigrants and recent immigrants holds at all education levels and across a variety of outcome measures (unemployment rates, employment rates, labour force participation rates, and median employment incomes). The size of the unemployment gap increases with educational attainment, which implies that the degree of skill underutilization is greatest among those who have the most to offer British Columbia.⁹

The literature on the integration of Canadian immigrants identifies several proximate causes of the poor labour market performance of recent immigrants. Three factors are particularly important. First, many immigrants lack Canadian work experience and foreign experience receives little to no value in Canada, relative to Canadian experience (Aydemir and Skuterud, 2004; Oreopoulos, 2009). Second, language barriers may impede many immigrants' integration into the Canadian labour market (Aydemir and Skuterud, 2004; Schaafsma and Sweetman, 2001). Finally, Canadian employers and occupational regulators may not value foreign education and credentials as highly as Canadian education and credentials (Ferrer and Riddell, 2008). These are the problems most commonly cited by immigrants themselves (Owen and Lowe, 2008). It is also important to note that the problems compound one another, and immigrants typically face multiple barriers simultaneously. As such, it is difficult to identify any one challenge as being more important than others (Business Council of British Columbia [hereafter referred to as 'Business Council'], 2006b).

In turn, these proximate causes of the underutilization of immigrants' skills may reflect a number of underlying issues. It may be that immigrants are in fact less skilled than comparable domestically-trained workers. Canadian employers and regulators may discount immigrants' foreign education and experience because that education and experience does not provide immigrants with human capital that meets Canadian standards (Bonikowska et al., 2008). An alternative explanation is that there are information problems and institutional deficiencies in the Canadian labour market. It is possible that immigrants do have adequate human capital, but Canadian employers and regulatory bodies have insufficient information about it (e.g. they do not know the quality of foreign educational institutions). The institutions surrounding the immigration and occupational regulation systems may fail to ensure that this information is available to employers and immigrants (Business Council, 2006b; 2007). Finally, it could be that immigrants face discrimination by Canadian employers or professional regulatory bodies on the basis of race, religion, language, etc. (Oreopoulos, 2009; Henry and Ginzberg, 1985).

Researchers have investigated each of these possibilities in the Canadian context, and each appears to play a role in explaining the poor outcomes of recent immigrants (Appendix 4 provides a more detailed description of the relevant research). If it were the case that immigrants' labour market underperformance were entirely driven by the low quality of human capital acquired abroad, then there would be no underutilization problem (i.e. if immigrants perform poorly because they are simply less skilled than non-immigrants, then we cannot say that their skills are being underutilized). However, the evidence suggests that the other factors mentioned above are

important. We place particular emphasis on institutional deficiencies and language barriers, since they are most amenable to policy intervention.

There is a lack of coherence between the immigration system and the system of labour market regulation in Canada. Immigration is administered by the federal government, while professions are regulated by provincial governments or by occupational licensing bodies given regulatory authority by the provinces. The federal Skilled Worker Program uses a 100 point scale to select permanent residents based on their: education (up to 25 points), knowledge of English and/or French (24 points), experience (21 points), age (10 points), arranged employment (10 points), and adaptability (10 points). Education points are awarded whether or not the immigrant's education and credentials are likely to be recognized by the provincial regulatory body overseeing his or her intended profession.¹⁰ It is the responsibility of the immigrant to contact the regulatory body responsible for her intended occupation in her intended province of residence in order to determine whether or not she is qualified to work in her profession in Canada.¹¹ There is no formal federal or provincial body to carry out credential assessments, such as they have in Australia and New Zealand (Business Council, 2007), and immigrants do not have to undergo an assessment before migration. British Columbia does have the independent International Credential Evaluation Service, but employers and regulators do not have to accept its assessments.

Provinces are allowed to nominate a number of the immigrants that gain entry to Canada through the federal Skilled Worker Program. British Columbia operates a Provincial Nominee Program (PNP) which allows skilled and/or experienced workers and experienced business people and their families a fast-tracked stream to Permanent Resident status. A recent review of the program found that "...the BC PNP is increasing the benefits of immigration to British Columbia..." and that "...the BC PNP's focus on meeting specific regional labour market and economic development needs along with priorities clearly differentiates it from [other economic integration] programs, and highlights its continuing relevance." The skilled worker component of the PNP has grown substantially since its inception in 2001 but is currently capped at 3,500 nominations a year. Roughly eight percent of BC immigrants over the period 2006 through 2010 came in through BC's PNP for workers. Another 14 percent came in through business class, but at 36 percent, the largest group went through the federal portion of the Skilled Worker Program.

Given this lack of interjurisdictional coordination, it is unlikely that the current institutional arrangement succeeds in providing immigrants with the information and certainty they require in order to achieve economic integration post-migration.

Language barriers are another key factor. British Columbia has language training programs for immigrants, but not much is known about their effectiveness and it is not clear that marginal changes in language training would deliver significant benefits in terms of immigrants' English skills and labour market outcomes. The federal Skilled Worker Program's points system

assigns significant weight (24 out of 100 points) to language, but there is a strong emphasis on bilingualism. Applicants can obtain up to 16 points for fluency in one official language (typically but not necessarily English), and an additional 8 points for fluency in the second official language.

The focus on bilingualism may be misplaced. Oreopoulos (2009) finds that knowledge of multiple languages (including English and French) has no impact on the callback rate for immigrant job applicants in Toronto (an ethnically diverse but predominantly English-speaking city, not unlike Vancouver). Knowledge of English is a significant determinant of immigrant labour market outcomes in Canada, while knowledge of French is not (Schaafsma and Sweetman, 2001). Given these findings, and given that the federal Skilled Worker Program does not select immigrants for Quebec, it would be beneficial to reduce the emphasis on bilingualism in skilled worker immigration.

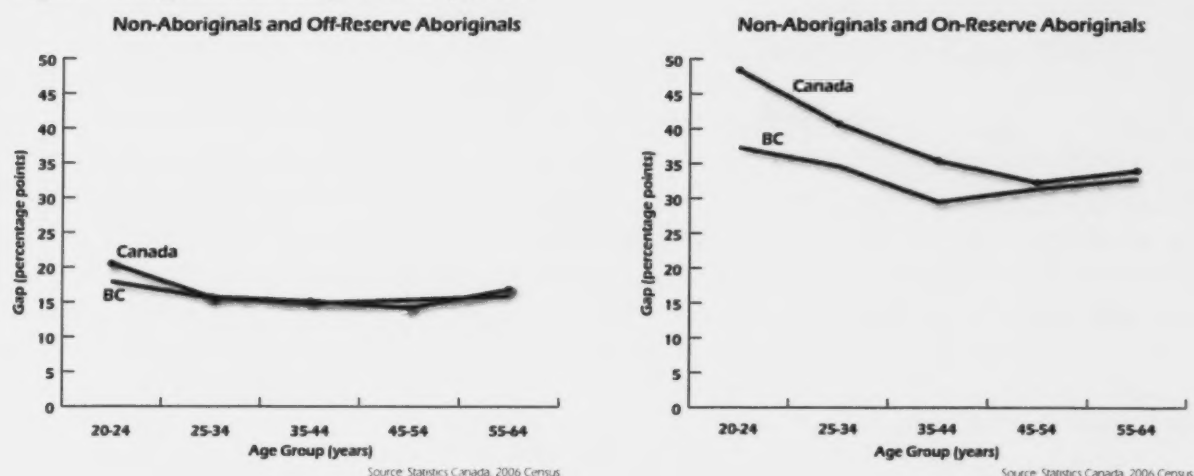
A similar issue exists in terms of the allotment of points for work experience. Prospective immigrants receive up to 21 points (out of 100) for work experience, whether it be Canadian or foreign, plus up to five additional points if some of the experience was acquired in Canada. This means that over four fifths of the points for work experience may be awarded for foreign work experience that will yield next to no returns in the Canadian labour market. Awarding points only for Canadian experience would be too severe a restriction on the pool of potential immigrants who could qualify to enter Canada, but it may be worthwhile to reduce the weight given to work experience in favour of something (like language) more likely to have a positive impact on immigrants' economic and social integration.

B. Human Capital among Aboriginal People

It is well-known that the educational outcomes of Canada's Aboriginal people are very poor relative to those of non-Aboriginal people. According to the 2006 Census, 43.7 percent of Aboriginal people 15 and over did not possess a high school diploma or an equivalent certificate; among non-Aboriginals, this proportion was 23.1 percent. As a result of its poor level of educational attainment, Canada's Aboriginal population is vulnerable to joblessness, low-income status and economic deprivation. Sharpe et al. (2009) show that differences in educational attainment account for approximately 30 percent of the annual earnings gap between Aboriginal and non-Aboriginal Canadians.

British Columbia's performance with respect to Aboriginal education is good relative to the Canadian average. The gap between the high school completion rates of non-Aboriginals and off-reserve Aboriginals is similar in British Columbia and Canada, but substantially smaller (i.e. by 2.6 percentage points) among the 20-24-year-old cohort (Figure 12). For on-reserve Aboriginal people, the outcomes gap vis-à-vis non-Aboriginals is larger in Canada than in British Columbia for all age groups, especially the 20-24, 25-34 and 35-44 cohorts.

Figure 12: High School Completion Gap, 2006



In terms of educational attainment among Aboriginal people aged 25 to 34, British Columbia is above the Canadian average in high school completion rates (29.2 percent versus 26.2 percent in Canada) and in trades certificates (13.2 percent versus 11.8 percent in Canada). However, the province is below average in attainment rates at the college level (21.4 percent versus 21.8 percent) and the university level (7.5 percent versus 8.3 percent). Thus, British Columbia performs well (relative to the Canadian average) in Aboriginal high school education and trades certification, but falls short in more advanced forms of education (Table 36).

In British Columbia and in Canada, young cohorts are attaining high school and post-secondary education at higher rates than previous generations among both Aboriginals and non-Aboriginals. This is a positive trend. However, educational attainment is increasing faster for non-Aboriginals than for Aboriginals. Among non-Aboriginals, the rate of university degree attainment is 11.8 percentage points higher among the 25-34 cohort than among the 45-plus cohort. Among Aboriginals, the gap is only 1.4 percentage points. The same trend holds at the college level. This implies that the post-secondary education gap between Aboriginals and non-Aboriginals is increasing over time. The same trends hold for Canada as a whole (Table 36).

Improving the educational outcomes of Aboriginal people should be a top priority for policymakers, both for equity reasons and because evidence suggests that improved education among people from disadvantaged backgrounds can yield substantial returns in the form of enhanced productivity (Riddell, 2007a). While the education of on-reserve Aboriginal people is a matter of federal jurisdiction, Richards et al. (2008) point out that five in six Aboriginal students in British Columbia attend provincially-run, off-reserve schools. Thus, provincial policymakers have significant power to influence Aboriginal education.

OFF-RESERVE SCHOOLS

Education performance among Aboriginal students is influenced by a variety of factors at the individual, family, school, and school district levels. Richards et al. (2008) attempt to explain differences between test results for Aboriginal and non-Aboriginal students using Foundation Skill Assessment (FSA) data for 366 schools over five school years. Socioeconomic variables, the peer effect and district effects were used to explain the gap between Aboriginal and non-Aboriginal results. Socioeconomic variables included education, employment, income, mobility, single parenthood and low income rate. Peer effects consider whether or not Aboriginal students perform better in schools where non-Aboriginal students perform well (positive effect) and whether or not a higher proportion (or large group) of Aboriginal students encourages formation of low academic expectations (negative effect). District effects assess the impact that school districts have on the test results gap.

About one-quarter of districts were found to have a statistically significant impact on the gap between Aboriginal and non-Aboriginal meet-exceed ratios (MERs). An analysis using the social, peer and district variables found that the Aboriginal MER would be:

- 17.7 percent higher if Aboriginal social indicators matched those for non-Aboriginals;
- 47.5 percent higher if the negative peer effect could be eliminated; and,
- 66.6 percent higher if all school districts performed as well as the best district in this sample without any changes in social condition or peer effects.

Social conditions are an important consideration but are not the focus of this report. The Social Condition (BC Progress Board, 2006) makes a number of policy suggestions for BC. Richards et al. caution that the measured peer effect may also capture socioeconomic effects and more recent research by Friesen and Krauth (2009) found that having a greater proportion of Aboriginal peers, if anything, improves Aboriginal students' achievement in BC. The authors suggest a possible explanation for the absence of peer effects is the additional funding BC provides for Aboriginal programs. Another consideration is that districts with large Aboriginal populations are more likely to have more Aboriginal teachers and research shows several reasons why Aboriginal students may perform better with an Aboriginal teacher (see Appendix 4.B).

Potential peer effects should be kept in mind when designing policy but as their existence and impact in BC are unclear and school district effects explain the largest portion of the gap these will be considered in more detail. Richards et al. (2008) found that relatively successful districts share four key qualities.

First, Aboriginal education success is clearly a long-term priority as demonstrated by the existence of a high ranking position to drive the monitoring and improvement of Aboriginal programs and by programs focused on cross-cultural awareness. Specifically, programs are focused on

relationship building between Aboriginals and non-Aboriginals and educating the entire school community about Aboriginal culture.

Second, Aboriginal communities are involved in educational decision-making in a meaningful and well-established way and Aboriginal leaders champion the benefits of education and advocate change. More successful districts have a history of shared decision-making and Aboriginal communities may have oversight of funding and program decisions.

Third, schools and districts determine their goals and collect and use objective data on Aboriginal performance in designing and evaluating their programs. Ministry tracked statistics (Foundation Skills Assessment test results, successful transition to the next grade, provincial exam results, and completion and graduation rates) are available by school district and have separate results for Aboriginal students. More successful districts use these and their own additional measures to evaluate programs, celebrate successes and push for further improvement.

Fourth, policy plans are implemented. More successful districts are able to align the parties involved, create innovative programs and implement them. The importance of district-level innovation and planning are consistent with findings from other jurisdictions (Maguire, 2003; Togneri and Anderson, 2003).

Appendix Tables 5 through 8 in Appendix 4.B present results for Aboriginal and non-Aboriginal students in BC, and for two high-performing and two low-performing districts identified in Richards et al. (2008). These tables reflect considerable variation in results by district and show that two of the high-performing districts identified in the study generally perform well on a variety of indicators and two of the low-performing districts continue to come in below average on many measures.

The Ministry of Education's policies support these four elements by requiring Aboriginal Education Enhancement Agreements (and annual reports on them), providing extra funding for Aboriginal programs and reporting performance data for Aboriginal students.¹²

Recognition that "...Aboriginal learners are not experiencing school success in British Columbia" led to the creation of Aboriginal Education Enhancement Agreements (AEEA) in 1999. An AEEA brings together representatives from the school district, all local Aboriginal communities and the Ministry of Education to improve Aboriginal students' achievement. Agreements feature shared decision-making and specific goals and highlight the importance of academic performance and the integral nature of Aboriginal culture and languages to Aboriginal student development and success. As of 2011, 52 of 60 school districts had five-year agreements in place. Seven of these were on their second agreement and three districts were on their third. Four of the other nine districts had draft agreements and the other four were in the planning stage. Once this milestone is achieved the next challenge is to integrate the features of the agreement into school and District plans.

Additional funding of \$1,160 per student (full-time equivalent) is provided for school districts to develop and deliver Aboriginal education programs and services. British Columbia's approach allows districts considerable flexibility in how they choose to spend this money.

Aboriginal students' outcomes will not improve without the support of teachers. Although the research noted above highlights the importance of Aboriginal educators, an empathetic teacher with strong cross-cultural awareness coupled with well-developed skills and a drive to make a difference is a tremendous asset regardless of ethnicity.

British Columbia is already a national leader in terms of engaging Aboriginal communities and parents and involving them in the education process (Richards and Scott, 2009). This is important for overcoming Aboriginals' cultural disconnect from formal education created by residential schools. Experience in British Columbia shows that positive results are possible when individual school districts are encouraged to undertake their own Aboriginal education initiatives.

ON-RESERVE SCHOOLS

Aboriginal people living on reserves face additional institutional challenges. On-reserve Aboriginal students typically attend small, band-run schools that do not benefit from economies of scale in administration and service provision. The lack of a true education system for on-reserve schools has been identified as a key institutional barrier to improved educational outcomes for on-reserve Aboriginal students in Canada (Mendelson, 2008; Bell et al., 2004; Royal Commission on Aboriginal Peoples, 1996). Mendelson (2008) and Richards et al. (2008) suggest that the establishment of Aboriginal school boards to bring a number of on-reserve schools (i.e., at least 12) under the authority of a single administration would professionalize on-reserve school administration and allow for greater accountability and efficiency in administrative services such as curriculum design, human resources management, and special education services.

British Columbia is further ahead than the other provinces in this respect. Legislation has already been passed at the federal and provincial levels (in 2006 and 2007, respectively) to recognize British Columbia First Nations' jurisdiction over education. Participating First Nations are able to form Community Education Authorities (CEAs) to administer on-reserve schools. CEAs are to be funded by the federal government (on terms that have yet to be negotiated), with additional funding from the provincial government if students from outside the relevant First Nations attend CEA-run schools. Mendelson (2008) makes a compelling argument that devolution of Aboriginal education will remain incomplete until First Nations have the funds to create the type of school system other British Columbians have had since the 1950s.

This framework is compatible with the type of Aboriginal school boards advocated by Mendelson (2008) and Richards et al. (2008), but there are potential pitfalls. The flexibility of the existing framework allows for CEAs run by a single First Nation and administering a single school. This would not address the key aim of Aboriginal school boards, which is to exploit economies of scale in school administration and to create Aboriginal education systems.

As outlined in more detail by others, we suggest federal funding for Community Education Authorities (CEAs) be structured so as to provide a strong incentive for bands to establish reasonably large CEAs. We agree with Richards and Scott (2009) that the federal government should provide per-student funding increases of at least 25 percent to schools that organize under school authorities of at least 12 schools. Of course, any such inducement would have to be negotiated by the federal government and the representatives of British Columbia First Nations.

VI. Policy Analysis and Recommendations

British Columbia is a leader in human capital development.¹³ Its performance is above average along almost every dimension. Nevertheless, there are areas in which further improvements would be likely to yield significant social and economic gains. We have identified four challenges: better utilization of the human capital of recent immigrants; better educational outcomes for Aboriginals; greater production of advanced human capital through university graduates, particularly at the postgraduate level; and the continued reduction of the high school drop-out rate. We briefly discuss each in turn.

A. Underutilization of Recent Immigrants' Skills

Recent immigrants are well educated relative to the general population, but their labour market outcomes are sub-par. The underutilization of immigrants' skills represents a significant missed opportunity for British Columbia.

As the Business Council (2007) points out, "the less emphasis a country has on a job offer as a pre-condition for migration, the greater is the necessity of having a migrant's qualifications evaluated." Currently, Canada formally emphasizes neither job offers nor credential assessment. Existing policies in Canada admit immigrants on the basis of their education and work experience with no assessment of the degree to which that education and experience will be valued in the labour market. Additionally, the onus is on the immigrants to find the relevant professional regulatory bodies in order to determine the acceptability of foreign credentials. There is room for improvement in this policy framework. The following are worth exploring:

- Admission via the federal Skilled Worker Program should be more focused on what is valued by Canadian employers. The program uses a 100 point scale to select permanent residents based on: education (up to 25 points), knowledge of English and/or French (24 points), experience (21 points), age (10 points), arranged employment (10 points), and adaptability (10 points).
 - o Of the 24 points available for language skills, up to 16 are awarded for fluency in one official language and up to eight are awarded for fluency in the other. The program does not select immigrants for Quebec and research suggests knowledge of English is a significant determinant of immigrant labour market outcomes in Canada while knowledge of multiple languages is not. Some or all of the eight points available for an additional official language should be reallocated to the first.
 - o Foreign work experience is of little to no value in the Canadian labour market yet all 21 "experience" points can be awarded for foreign work experience with only an additional five points under the "adaptability" category awarded for Canadian experience. Points

- should be removed from the experience category and added to the language category.
- o Further, BC's Provincial Nominee Program should be allowed to grow such that half of those entering BC as skilled workers come through the provincial system.
- The provincial government should establish a formal credential recognition framework; create a single, recognized body to oversee assessments; and use its authority over the province's occupational regulatory organizations to ensure that credential assessments are respected by employers. This may involve the construction of sector-specific databases of international educational institutions, as recommended by the Business Council (2006b). The federal government should strongly encourage prospective immigrants to undergo an assessment early in the immigration process.

Key indicators of progress in the utilization of recent immigrants' skills are the gaps between recent immigrants and non-immigrants in various labour market outcomes – chiefly the employment rate, unemployment rate, and median labour earnings conditional on education level. The closing of these gaps will indicate that progress is being made. Table 3 below presents employment and unemployment rates for recent immigrants and those born in Canada for 2006 through 2010.

Employment rates are higher for those born in Canada relative to recent immigrants in all available years and for every education level. Similarly, unemployment rates for those born in Canada are lower than for recent immigrants for all possible comparisons.

Table 3: BC Employment and Unemployment Rates, aged 25-54										
	Employment to Population					Unemployment to Population				
	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
<i>All Education Levels</i>										
Recent Immigrants	73.1	73.9	73.5	76.5	73.3	3.9	4.9	4.8	5.9	7.2
Born in Canada	83.4	84.2	84.4	80.9	81.7	3.2	2.7	3.2	5.6	5.3
<i>Post-Secondary Certificate or Diploma</i>										
Recent Immigrants	72.8	74.9	74.3	80.7	73.8	n/a	n/a	6.8	n/a	n/a
Born in Canada	86.6	87.6	87.6	83.6	83.9	3.0	2.5	3.1	5.4	5.2
<i>University Degree</i>										
Recent Immigrants	78.1	78.0	74.7	80.1	75.5	4.6	4.6	4.2	5.6	7.9
Born in Canada	88.3	89.7	89.6	88.1	89.5	2.9	1.9	2.2	3.5	3.1
<i>Bachelor's Degree</i>										
Recent Immigrants	74.9	74.7	73.6	78.0	74.2	5.4	5.4	n/a	5.5	10.2
Born in Canada	87.5	88.8	88.9	87.6	88.7	3.1	1.9	2.3	3.7	3.5
<i>Above Bachelor's Degree</i>										
Recent Immigrants	83.6	84.6	76.5	84.3	77.3	n/a	n/a	n/a	n/a	n/a
Born in Canada	90.4	92.0	91.1	89.2	91.6	2.4	n/a	2.0	3.2	2.3
Sources: BC Progress Board; Statistics Canada										

B. Aboriginal Education Gaps

The educational outcomes of Aboriginal people are very poor relative to those of non-Aboriginals in Canada, and this education gap contributes to a severe labour market outcomes gap. While British Columbia performs better than average in this respect, the outcomes gaps for Aboriginals in the province are still unacceptably large.

The ongoing effects of residential schools, manifested as decreased trust of government and the school system and a break in the transfer of knowledge of, and pride in, Aboriginal culture will continue to be an impediment to success in Aboriginal education for the foreseeable future. The key challenges in Aboriginal education are to overcome cultural and socioeconomic barriers to high educational achievement and to ensure that promising practices in Aboriginal education can be adopted wherever they are appropriate.

OFF-RESERVE SCHOOLS

Research, analysis and consultations conducted for this report reinforce the findings in Richards et al. (2008) that school district-level policies – Aboriginal education seen as a priority for all in the district, Aboriginal communities involved in decision-making, use of objective data for program development and tracking results, and successful implementation of district-level plans – have a substantial impact on Aboriginal students' education outcomes. Further, Ministry of Education policies support these key components and many school districts have embraced some or all of them. Recent data show that the Aboriginal completion rate improved by over 30 percent in the last ten years while the rate for all students grew by six percent.

Hard work by Aboriginal students and the many people that support them is paying off. However, from an outside perspective, what is still missing is ongoing, consistent, rigorous analysis to identify what is helping Aboriginal students improve their education outcomes in successful districts and what barriers remain in other districts.

We suggest a new, independent group be established to provide this missing research and communicate the results. Funding could be provided by one or any combination of: a leading Aboriginal organization or a collection of individual First Nations, the BC Government and Aboriginal Affairs and Northern Development Canada (AANDC). Financial support from all involved would be ideal but this group could be established by any one organization. The work of a small professional staff would be directed by an independent, volunteer board chosen by the funding organizations and drawn from those involved in Aboriginal education.

Research and consultations conducted for this paper yielded several potential research topics:

- Do districts go through similar phases on the path to success? For example, could getting Aboriginal education recognized as a priority for the entire district be viewed as an essential phase that all successful districts will go through?
- If there are recognizable phases on the path to Aboriginal education success what indicators of progress are the most appropriate for each phase? For example, is it reasonable to expect better FSA results and completion rates from a district without an Aboriginal Education Enhancement Agreement in place or should building consensus and getting the agreement in place be the measure of success for that phase?
- Is there a set of indicators beyond those mandated by the Ministry of Education which successful districts use to measure performance and guide programs?
- What are the main differences in how Aboriginal and non-Aboriginal students move through BC's education system? To what extent are performance gaps present at Kindergarten and do they continue to grow throughout K-12? How do Aboriginal and non-Aboriginal dropouts differ?
- What is the extent of Aboriginal participation in special programs (Learning Centres for example)? Programs where Aboriginals represent a significant proportion of the total should be reviewed to see if the program suits their learning needs.

It is easy to find Aboriginal-specific policies that make sense and seem to be working. However, administrators in other districts need more detailed background information [socioeconomic conditions; Aboriginal (on- and off-reserve and Métis) composition; and, why the proponents feel this is working well] so they can determine how appropriate the policy is for them.

ON-RESERVE SCHOOLS

On-reserve Aboriginal students typically attend small, band-run schools that do not benefit from economies of scale in administration and service provision. This institutional challenge will require ongoing cooperation between Aboriginal communities and the federal and provincial governments. In the short term, the key suggestion is the following:

- Promote the establishment of Aboriginal school boards to administer on-reserve schools, as recommended by Mendelson (2008).¹⁴ To produce the maximum benefit from economies of scale and the professionalization of administration, the boards should be sufficiently large. As suggested by Richards and Scott (2009), the federal government should provide per-student funding increases of at least 25 percent to schools that organize Community Education Authorities (CEAs) of at least 12 schools. Of course, any such inducement would have to be negotiated by the federal government and the representatives of British Columbia First Nations.

BC PROGRESS BOARD INDICATORS

Key indicators of progress in Aboriginal education that the BC Progress Board plans to track are gaps between Aboriginal and non-Aboriginal education and labour market outcomes. The recent addition of self-identified Aboriginals to the Labour Force Survey provides provincial level gaps on education attainment, employment and unemployment. Table 4 shows that Aboriginal youth (aged 19 to 24) in BC are more than three times as likely to lack high school graduation as non-Aboriginals.

Table 4: Proportion of Labour Force Without High School Graduation, Aged 19-24

	Non-Aboriginal				Aboriginal			
	2007	2008	2009	2010	2007	2008	2009	2010
Canada	11.5	11.9	10.9	10.6	29.1	28.2	28.9	25.1
NL	11.0	9.8	10.4	9.8	n/a	n/a	n/a	n/a
PE	13.1	10.6	8.0	9.6	n/a	n/a	n/a	n/a
NS	11.4	11.0	10.7	10.2	n/a	n/a	n/a	n/a
NB	8.5	11.5	10.7	9.2	n/a	n/a	n/a	n/a
QC	15.1	16.2	16.1	14.4	41.9	n/a	30.8	n/a
ON	10.3	11.1	9.8	9.3	29.5	25.1	26.2	20.4
MB	12.5	11.9	10.0	10.9	36.6	31.9	30.9	30.8
SK	10.7	9.4	9.2	9.4	25.7	33.3	32.0	27.4
AB	11.7	12.7	10.4	11.4	27.4	29.1	35.3	26.7
BC	9.1	7.4	6.6	8.1	25.7	30.3	24.2	26.2

Sources: BC Progress Board; Statistics Canada

Table 5 shows that Aboriginal and Non-Aboriginal employment rates for those aged 25 to 64 with a post-secondary credential were close in 2007 but that employment deteriorated more rapidly and much further for Aboriginals than Non-Aboriginals in the recent recession. Table 5 also reveals that Aboriginal unemployment rates are roughly double those of Non-Aboriginals and that the Aboriginal unemployment increase was larger in 2009 and that the improvement in 2010 was smaller than for non-Aboriginals. In 2007, similar proportions of Aboriginals and non-Aboriginals were identified as "not in the labour force," which means they were unwilling or unable to supply labour services. By 2010, the proportion of non-Aboriginals outside the labour force was lower but the Aboriginal proportion was much higher than in 2007.

The gaps between the entire non-Aboriginal and off-reserve Aboriginal populations are likely to persist for decades to come, until the older and poorly educated cohorts of people leave the labour force. However, the long-term policy goal should be to completely close the gaps in high school completion rates and post-secondary enrolment rates between young cohorts of Aboriginals and non-Aboriginals.

Table 5: Labour Force Status of those in BC with a Post-Secondary Certificate or Degree, aged 25-64

	2007	2008	2009	2010
Employment				
Non-Aboriginal	80.8	80.8	78.5	78.8
Aboriginal	78.0	74.9	69.4	65.7
Difference	2.9	5.9	9.2	13.1
Unemployment				
Non-Aboriginal	2.6	2.9	5.1	4.8
Aboriginal	5.1	6.6	9.6	9.1
Difference	(2.6)	(3.7)	(4.5)	(4.3)
Not in Labour Force				
Non-Aboriginal	16.6	16.3	16.3	16.4
Aboriginal	16.9	18.5	21.0	25.2
Difference	(0.3)	(2.2)	(4.7)	(8.8)

Sources: BC Progress Board; Statistics Canada

C. Production of Advanced Human Capital

Although British Columbia is above the Canadian average in terms of the proportion of the population having attained a graduate degree (Table 15b), investment in increasing that proportion would likely yield significant economic benefits for the province. In a recent review of the relationship between education, productivity and economic growth, Coulombe and Tremblay (2009) find that relative returns to education depend on a country's distance from the technological frontier.¹⁵ Citing a study by Vandenbussche, Aghion and Meghir (2006), they note that a marginal increase in the population with higher education has a larger effect on a country's total factor productivity growth the closer the economy is to the world technology frontier. This result follows from the idea that workers with high education will contribute more to productivity if they are employed in the innovation rather than the imitation sector of the economy and the former is concentrated more in countries close to the technology frontier.

Perhaps surprisingly, given Canada's large productivity gap with the United States, Vandenbussche et al. report that Canada is very close to the world technological frontier. The implication is that the returns to higher education in Canada remain high.

British Columbia's high level of university attainment is the result of the province attracting highly educated persons from outside its borders. In terms of within-province generation of university degrees, British Columbia is below average. In particular, its university enrolments as a proportion of the population aged 18-29 is below average at the graduate level (Table 9b).

The below-average graduate enrolment rate suggests that there is room for the province to improve its advanced education attainment by promoting greater enrolments in graduate programs at British Columbian universities. This should be seen as a complement, rather than a substitute, for the province's success in attracting highly educated people from elsewhere. Indeed, given the labour market challenges faced by well-educated immigrants from outside the English-speaking world (as discussed above), the development of more advanced human capital within British Columbia would likely deliver benefits that could not necessarily be obtained by importing human capital from abroad. In addition, competition among countries for skilled immigrants is becoming increasingly fierce and Census data indicate that fewer foreign students are choosing to remain in Canada than in the past (Turpin and Sager, 2009). Suggestions for increasing the production of advanced human capital within British Columbia are the following:

- Reallocate the funding at British Columbian universities to promote greater enrolments in graduate programs. A reasonable policy goal for BC is to reach 4.0 percent of the population aged 18-29 by 2020. Achieving this would require growth at twice the pace seen in BC between 2000 and 2008.
- Develop a comprehensive graduate student fellowship program, similar to those available in Quebec and Ontario. This can help attract more international students, encourage British Columbian students to pursue graduate studies, and increase the research output of British Columbia's universities.

BC PROGRESS BOARD INDICATORS

The key indicators of progress in advanced human capital development are the graduate enrolment rate and the proportion of the population with education above a Bachelor's degree. In contrast to the share of BC's population with graduate level education (described next), British Columbia's graduate *enrolment* rate has been in the middle of the pack of provinces over the last sixteen years and has lost ground relative to top-ranked provinces and the Canadian average (Table 6).

British Columbia has seen significant improvement over the last 18 years in the proportion of the population aged 18-29 with graduate level education. In 1992, BC ranked ninth among provinces and its ratio was well below first-ranked Ontario's and the Canadian average. In 2010, BC ranked fifth and its ratio was 17 percent below the Canadian average and about one-third below Ontario's.

Table 6: Graduate Level Enrolments, Percent of Population Aged 18 to 29

	1992	2000	2008
Canada	2.1	2.4	3.1
Newfoundland and Labrador	1.1	1.9	3.4
Prince Edward Island	0.1	0.4	1.1
Nova Scotia	2.1	3.1	4.4
New Brunswick	1.2	1.4	2.0
Quebec	3.1	3.6	4.7
Ontario	1.9	2.1	2.8
Manitoba	1.9	1.6	2.1
Saskatchewan	1.5	1.7	1.5
Alberta	1.6	2.0	2.3
British Columbia	1.7	1.9	2.6

Sources: BC Progress Board; Statistics Canada

Table 7: Education Above a Bachelor's Degree, Percent of Population Aged 18 to 29

	1992	2000	2010
Canada	1.7	2.8	3.2
Newfoundland and Labrador	0.7	2.1	1.6
Prince Edward Island	1.7	1.9	2.8
Nova Scotia	1.2	3.3	3.8
New Brunswick	1.0	2.0	1.2
Quebec	1.4	2.6	3.4
Ontario	2.5	3.8	4.0
Manitoba	1.0	1.9	2.1
Saskatchewan	1.0	1.5	1.9
Alberta	1.4	1.6	2.0
British Columbia	1.0	2.2	2.6

Sources: BC Progress Board; Statistics Canada

D. High School Non-Completion

High school non-completers face significant economic challenges and contribute less to the economy on average than they would if they had completed high school. British Columbia's six-year completion rate improved considerably between the late 1990s and early 2000s but has been within one percentage point of the 79.6 ratio reached in 2003/04 since then. This suggests that in each of the last seven years roughly 20 percent of BC students did not complete high school.

According to labour force survey (LFS) data, British Columbia has the best high school completion rate in the country. In 2010, 90.4 percent of BC's population aged 19 through 24 had a high school credential. Similar to BC's completion rate data the LFS shows considerable improvement between the late 1990s and early 2000s but, unlike BC completion data, it shows continued improvement through 2009.

Granted, these two data series do not measure the same things so we should not expect them to move in unison. However, the discrepancy between them suggests that over half of those who do not complete their K-12 education in six years from the grade eight starting point either get a certificate through their own effort, take a little longer to complete in the public system or find another path to completion.

British Columbia should continue to take measures to increase high school completion and this requires an indicator to track changes. A 2002 BC Progress Board report (BC Progress Board, 2002) suggested the province "Broaden and extend pathways to graduation and target an increase in the overall secondary program graduation rate at a minimum of 85% by 2010..." As noted above, BC's completion rate has not moved much above 80 percent. Pathways to graduation in BC have broadened but the main metric does not adequately capture them.

Improvements in a rate get more difficult and more expensive to achieve as it approaches 100 percent. The six-year completion rate on its own is useful but insufficient for the task of accurately measuring the true incidence of non-completion. Labour force data provide a cross-check on six-year completion but include little information that can help guide policy.

- We suggest the province close this gap in knowledge by developing a new indicator which can, to the extent possible, track all paths to completion. Creating an "Overall Completion Rate" indicator will be a significant challenge but it is necessary if BC is to realize the goal of being the best-educated, most literate place in North America. Without such a measure we cannot identify groups of people with unmet needs and develop programs to fill these needs. Simply looking for improvements in the six-year completion rate is likely to lead to wasted resources and missed opportunities.

- We suggest that policymakers aspire to continuously increase the overall completion rate; that is, to set a target drop-out rate of zero percent. This would obviously be a 'soft target,' since it is unrealistic to suppose that it will ever be reached (and further reductions would surely become uneconomical beyond some high completion rate). However, the goal of 100 percent completion would help ensure that those students who still cannot graduate are identified and offered assistance appropriate to their needs and circumstances.

One of the groups which will benefit from additional attention consists of those who leave the K-12 education system without an alternate completion path. Simply put, those who drop out. Foundation Skill Assessment results can be used to identify potential drop-outs early in their school careers, but school administrators, teachers and researchers require high quality information on the characteristics of high school non-completers so that interventions can be designed to address the particular needs of potential drop-outs. The information currently available in the British Columbia context is cursory. Statistics Canada provides overall drop-out rates at the provincial level, and the Censuses allow for the computation of ex post non-completion rates according to various demographic criteria (gender, visible minority status, immigrant status, etc.). BC Stats provides non-completion rates for Aboriginal students and students with disabilities (British Columbia, 2006).

However, we have little information on the key personal, family, and school-specific factors that influence the decision to drop out of school in British Columbia. This is the sort of information that would likely be most useful in designing policy interventions. The government has a role to play in collecting this information and making it publicly available.

Thus, we offer the following recommendations for the BC government:

- Invest in the production of better information about the personal and family characteristics of high school drop-outs in British Columbia, as well as evidence on the school- and district-level factors associated with non-completion. A study modeled after Government of Alberta (2009) would be a good starting point. Such information could be used in conjunction with FSA scores to identify potential drop-outs at a young age and to further develop and refine programs to help them graduate.
- Report ratios of performing and underperforming students by district and, provide a provincial summary for those who are underperforming showing: the grade in which performance issues were identified; what interventions have been tried; and, whether or not the person is still in school.

BC PROGRESS BOARD INDICATORS

The BC Progress Board began reporting the proportion of the labour force population (aged 19-24 years) with a high school certificate by province in its 2010 Benchmark Report. As population and labour force population are close for this age group, ratios are similar whether population or labour force population is used as the denominator. The Board's reporting will switch to track graduates as a share of the population to reflect the importance of accounting for everyone's completion status.

Table 8: Population Without High School Graduation, Aged 19-24, %

	1992	2000	2010
Canada	19.1	15.7	11.5
Newfoundland and Labrador	21.0	12.6	11.2
Prince Edward Island	20.8	15.6	10.2
Nova Scotia	21.9	14.7	10.6
New Brunswick	18.6	14.1	9.5
Quebec	19.8	18.4	15.9
Ontario	20.0	15.0	9.8
Manitoba	17.3	18.1	12.9
Saskatchewan	17.7	14.5	10.8
Alberta	19.1	16.4	12.6
British Columbia	15.6	12.8	9.6

Sources: BC Progress Board; Statistics Canada

VII. Conclusion

This report concludes that the province of British Columbia performs very well in the human capital area relative to the Canadian average and other provinces. This situation reflects the intelligent investment decisions and policies that have been made by both the public sector and by individuals in education. They have produced a province with very high student performance scores on standardized tests and a high proportion of the population with post-secondary credentials.

But challenges remain. The report identifies four areas in which further improvements would be likely to deliver substantial benefits to British Columbia: the utilization of the human capital of recent immigrants; the educational outcomes of Aboriginals; the production of advanced human capital through university graduates, particularly at the postgraduate level; and the continued reduction of the high school drop-out rate.

The first two are the most pressing of the four. The educational performance of the Aboriginal population in British Columbia, while somewhat superior to the national average, is still dismal, particularly for North American Indians on reserves. This issue must be addressed, both for equity reasons and because evidence suggests that improved education among people from disadvantaged backgrounds can yield substantial returns in the form of enhanced productivity.

The human capital of recent immigrants is above average, but its utilization is below average. Immigrants face many problems, including language skills, foreign credential recognition and Canadian experience, and consequently have difficulties integrating into the BC labour market. There are currently a wide range of programs to address this issue, but more needs to be done.

Recent research has found that countries close to the world technological frontier such as Canada may benefit more from investment in higher forms of education than lower forms. But Canada's investment in graduate students, especially at the PhD level trails most other OECD countries. The proportion of graduate students in British Columbia universities is below the national average. This is one of the few areas where British Columbia lags behind other jurisdictions in Canada. Boosting graduate education hence may represent a pathway to prosperity for the province.

High school non-completers face significant economic challenges and contribute less to the economy on average than they would if they had completed high school. According to labour force survey (LFS) data, British Columbia's high school completion rate has improved considerably since the early 1990s and is the highest in the country. Further improvements will be difficult but are worth pursuing.

It is unlikely that human capital challenges are a major cause of British Columbia's productivity

problem. However, human capital improvements can be an important part of the solution to that problem. The recommendations outlined in our first report for the BC Progress Board (Sharpe, Arsenault and Harrison, 2009) addressed a substantial impediment to productivity growth in British Columbia; namely, the province's poor performance in machinery and equipment investment. British Columbia is making progress in implementing the changes necessary to improve its investment performance, particularly through the harmonization of the provincial sales tax with the federal GST. The recommendations offered in the present report will support these changes by fostering further improvement in British Columbia's human capital performance and, ultimately, its productivity performance.

Endnotes

- 1 The authors would like to thank Joel Emes of the BC Progress Board, Craig Riddell of the University of British Columbia, and John Richards of Simon Fraser University for useful comments on earlier drafts of this report. The report has also benefited from consultations with key stakeholders in the education area in British Columbia. The insights garnered from these interviews have enriched the report. A list of the persons consulted is in Appendix 6.
- 2 The Business Council of British Columbia's recent project Outlook 2020: Shaping B.C.'s Economic Future includes several lengthy reports on human capital and related issues. The project web page is http://www.bcbc.com/Events_Descriptions/2020.asp.
- 3 A set of tables containing the data underlying the analysis in this report can be accessed online at http://www.csls.ca/reports/BCHC_Tables.pdf. They can also be accessed at the web site of the BC Progress Board. These tables are referenced throughout the report.
- 4 A natural experiment exploits variation in educational attainment that is caused by some force unrelated to a person's individual characteristics. For example, interprovincial differences in compulsory schooling laws (i.e. the age at which one can drop out of high school) can affect educational attainment but are not related to individual students' characteristics (Oreopoulos, 2006b). This allows for the use of statistical techniques that measure the impact of educational attainment without being biased by the unobservable individual characteristics.
- 5 In this subsection, years refer to the years in which academic years started. For example, '2008' refers to the 2008/2009 school year, which began in September 2008. Enrolments are counted in September of the school year or as soon as possible thereafter. These figures account for students enrolled in public schools operated by school boards or the provincial government, including publicly-funded schools, provincial reform schools, and public adult high schools. Also included are individuals who are recognized as students and funded by the provincial government, such as adults completing an unfinished high school program or a General Educational Development (GED) program. Thus, the numbers do not capture only elementary and high school students. Note also that the numbers exclude private school students, correspondence school students, and students in federally-funded schools (e.g. schools financed by Aboriginal Affairs and Northern Development Canada). See the appendix in Statistics Canada (2009) for more information.
- 6 A list of the centres is available at http://www.bced.gov.bc.ca/early_learning/pdfs/strong_start_contacts.pdf.
- 7 Our data are not disaggregated enough to allow an international comparison. Our definition of "post-secondary certificate, degree, or diploma" is much broader than that of "post-secondary non-tertiary education" found in the International Standard Classification of Education (ISED). However, according to Statistics Canada, 12 percent of Canadian residents have attained a "post-secondary non-tertiary" education. This is the highest among OECD countries for which this information is available, ahead of Iceland, Ireland, and New-Zealand (tied for second place at 11 percent).
- 8 See Statistics Canada (2003) for a precise definition of each of these domains.
- 9 These observations arise from a more detailed analysis of the Census data available in Appendix 4.
- 10 Contrast this with New Zealand, which carries out a credential assessment early in the immigration process and awards immigration points on the basis of New Zealand-equivalent educational attainment (Business Council, 2007).

11 In Canada, there are more than 50 regulated professions governed by over 400 regulatory and licensing bodies (Becklumb and Elgersma, 2008). Regulated professions constitute 15 to 20 percent of the Canadian labour force, but a much higher proportion of the intended professions of recent immigrants. In 2006, 41 percent of university-educated immigrants in Canada had studied in fields that normally lead to employment in a regulated occupation (Zietsma, 2010).

12 One example of a British Columbia government program that has improved the performance of Aboriginal students is the province's support for 'English as a second dialect' programs in schools. For an evaluation of this initiative, see Battisti et al. (2010).

13 Appendix 5 contains a summary comparison of British Columbia and Canada across a number of key human capital indicators. British Columbia's average ranking among the provinces is second only to Alberta's.

14 Note that this recommendation applies to on-reserve schools currently operated by bands. There exist urban Aboriginal magnet schools elsewhere in Canada (e.g. in Alberta and Manitoba) that are administered by Aboriginal boards. This is not what we are recommending.

15 An economy 'on the technological frontier' is an economy that makes intensive use of the most advanced known production technologies. Affluent economies such as Canada and the United States are near the technological frontier. Technical innovation is a key driver of economic growth in such economies (as opposed to developing economies, in which growth can be achieved through the imitation of existing technical advances discovered elsewhere).

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Appendices: Additional Information on Human Capital Development in British Columbia

In writing this report, we compiled data on a broad range of indicators pertinent to various dimensions of British Columbia's human capital performance. We provided an overview of these data in the body of the report, but left out many details. This was done in order to keep the report concise and focused on the four key areas for improvement. For readers interested in a more detailed description of British Columbia's human capital performance, Appendices one through four provide much of the additional material that was not explicitly covered in the main text. Appendix five introduces a tabular summary of 25 key indicators of human capital development. Appendix six lists the experts and stakeholders who were interviewed for this report.

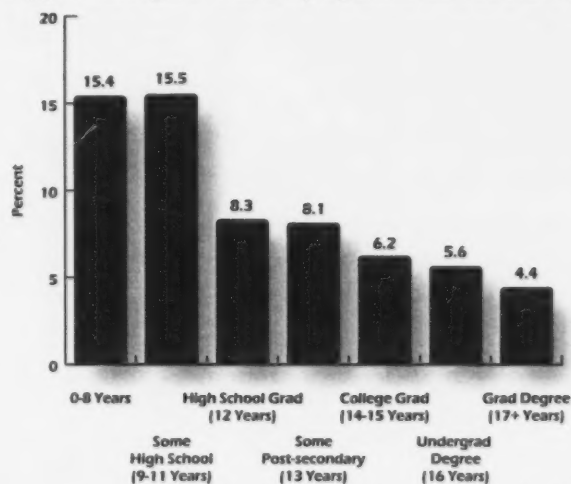
Appendix 1: The Importance of Educational Attainment

Section II of the report shows that there is a strong positive relationship between educational attainment and employment income in British Columbia. The following three charts illustrate that persons with more education tend to experience lower unemployment, participate at a higher rate in the labour force, and enjoy higher employment rates.

The overall unemployment rate in British Columbia was 7.6 percent in 2010, but only 5.6 percent for persons holding an undergraduate degree (Appendix Figure 1). By contrast, unemployment was above 15 percent among high school non-completers. In terms of employment opportunities, the data indicate that the greatest gains from increased education are for persons with a low initial level of education. High school graduation leads to a large decrease in unemployment.

The idea that literacy decreases the probability of unemployment is well supported by the literature (Holzer et al, 2007). As noted by Lynch (2007), in the United States, individuals

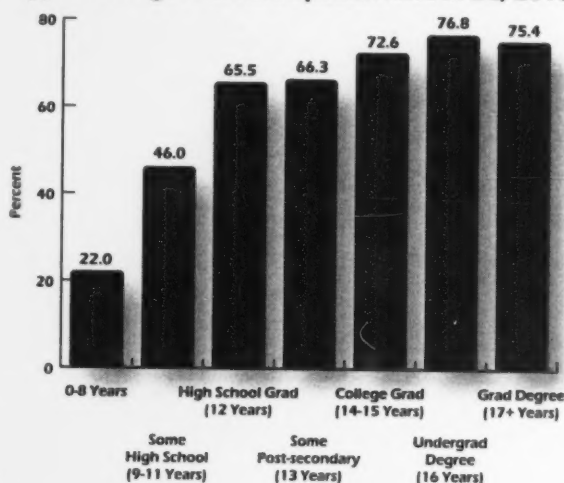
Appendix Figure 1: Unemployment Rate in BC, 2010



with low levels of prose literacy have double the rate of unemployment of those with high levels. These findings are in line with the data on educational attainment presented here.

Participation rates are also an important indicator of labour market performance, and labour force participation increases with education (Appendix Figure 2).^{A1} This likely reflects the greater range of job opportunities available to more educated workers, as well as the desire of well-educated people to earn a return on their investment in education. As was the case for unemployment, the big divide is between those who did not finish high school and those who did. In 2010 in British Columbia, labour force participation was below 50 percent among persons who did not complete high school, compared to 65.1 percent among persons with a high school diploma (but no post-secondary) and over 70 percent among people with post-secondary education.

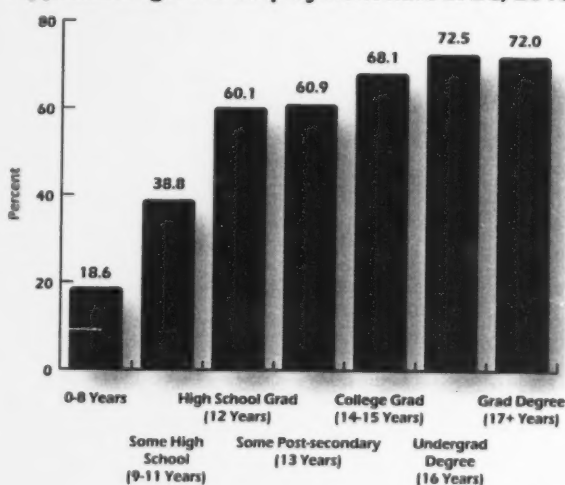
Appendix Figure 2: Participation Rate in BC, 2010



Source: Table 49b

It is no surprise that the employment rate also rises with educational attainment (Appendix Figure 3). The rate is significantly higher for people who completed some high school compared to those that never went to high school (38.8 percent versus 18.6 percent), and is even higher for people who actually completed high school (60.1 percent for those who stopped their formal education after graduating from high school, and 68.1 percent for those who went on to graduate from college). Once again, the greatest gains from increased education accrue to those with low initial levels.

Appendix Figure 3: Employment Rate in BC, 2010



Source: Table 49c

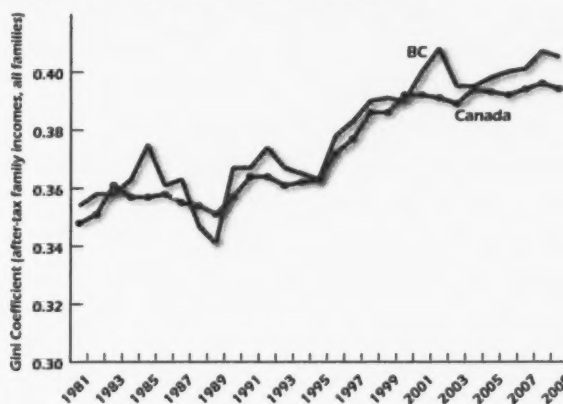
Another important potential impact of improved educational attainment is to decrease economic inequality. It is well-known that the distribution of income has become more unequal in Canada (and in many other countries) over the past three decades. In the United States, where the increase in income inequality has been particularly large, a substantial body of research has linked rising inequality to an increase in the skill premium.^{A2} The gap between the earnings of university

graduates and those of high school graduates without university has increased dramatically in recent decades, driven in part by technological changes that have increased the demand for advanced skills relative to unskilled labour. It is argued that this trend has been a significant driver of the increase in income inequality since 1980.

Appendix Figure 4 shows the increase in the inequality of after-tax family incomes in Canada and British Columbia since 1981. British Columbia became more unequal over the period, and its Gini coefficient of 0.401 was the highest among the provinces in 2007 (Osberg and Sharpe, 2009a).⁴³ To the extent that citizens care about economic equality and believe that inequality detracts from well-being, British Columbia's inequality is unacceptably high.

The relationship between income inequality and the skill premium is less well documented in Canada than in the United States. Some studies find that the skill premium has not increased in Canada in recent decades (Freeman and Needels, 1993; Murphy et al., 1998), but more recent research suggests that it has (Boudarbat et al., 2006; 2008). Whether or not the increase in Canadian income inequality since 1980 can be attributed to a widening skill premium, it remains true that increasing the educational attainment of low-income, low-education people would likely raise their earnings and reduce economic inequality.

Appendix Figure 4: Income Inequality



Source: Statistics Canada, CANSIM # Table 202-0705

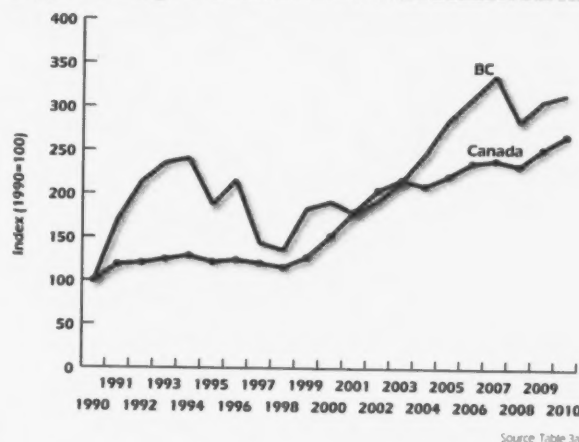
Appendix 2: Human Capital Infrastructure in British Columbia

A. INVESTMENT AND CAPITAL STOCK IN EDUCATIONAL SERVICES

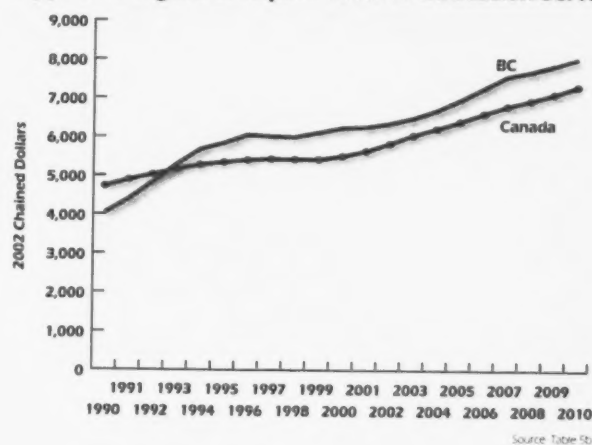
Appendix Figure 5 illustrates the trends in the educational services industry's real capital investment in British Columbia and Canada between 1990 and 2010. Real investment grew more quickly in British Columbia (5.92 percent per year) than in Canada (5.16 percent per year) over the period, although British Columbia's growth was also more volatile from year to year. British Columbia's real investment fell 15.7 percent in 2008 but had gained back more than half the loss by 2010. Among the seven provinces with comparable data, British Columbia tied for second place with Quebec and Manitoba in terms of the rate of real investment growth in educational services over the 1990-2010 period. Alberta was first.

Since the early 1990s, the value of the per-person capital stock in educational services has been greater in British Columbia than in Canada as a whole (Appendix Figure 6). The real capital stock increased 4.47 percent per year in British Columbia over 1990-2010, compared to 2.53 percent per year in Canada (Table 5b).

Appendix Figure 5: Investment in Education Services



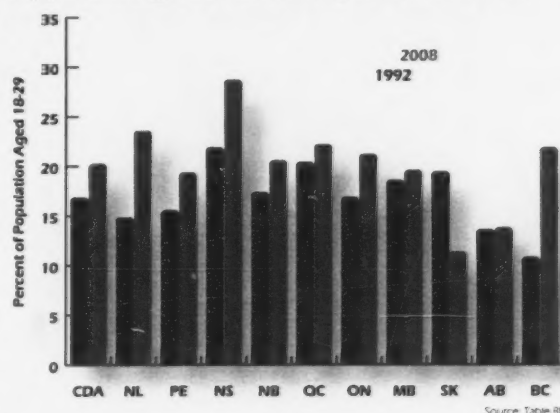
Appendix Figure 6: Capital Stock in Education Services



B. POST-SECONDARY ENROLMENTS

In 2008, 156,741 students were enrolled in British Columbia universities. This amounted to 21.7 percent of the population aged 18-29, above the Canada-wide average of 20.2 percent (Tables 8a and 8b).⁴⁴ The province ranked fourth among the ten provinces in terms of university enrolment rates in 2008 (Appendix Figure 7). British Columbia's university enrolment rate was low prior to 2008 but was offset by an above-average college enrolment rate. The large jump in university enrolments in BC in 2008 was due to several colleges being reclassified as universities.

Appendix Figure 7: University Enrolment Rate



While British Columbia was below average in terms of the level of its university enrolment rate prior to 2008, it was above average in terms of enrolment rate growth. The province's enrolment rate was 6.1 percentage points higher in 2007 than in 1992, when it stood at 10.7 percent. The national average increase was 3.1 percentage points over the 1992-2007 period. Among the provinces, only Newfoundland and Labrador and Nova Scotia experienced greater enrolment rate growth than British Columbia in percent terms. However, Newfoundland and Labrador's enrolment rate increase was driven by a decline in the university-aged population and although Nova Scotia's enrolment increased its university aged population fell (Table 1c). In contrast, British Columbia has achieved its fast enrolment rate growth in the context of a 16.5 percent increase in the university-aged population.

University enrolment rates were higher among females than among males throughout the entire 1992-2007 period in both British Columbia and Canada, and the gap widened over the period (Table 8d and Appendix Figure 8). The gender gap was consistently smaller in British Columbia than in Canada, but British Columbia was below the Canada-wide average in terms of both female and male enrolment rates.

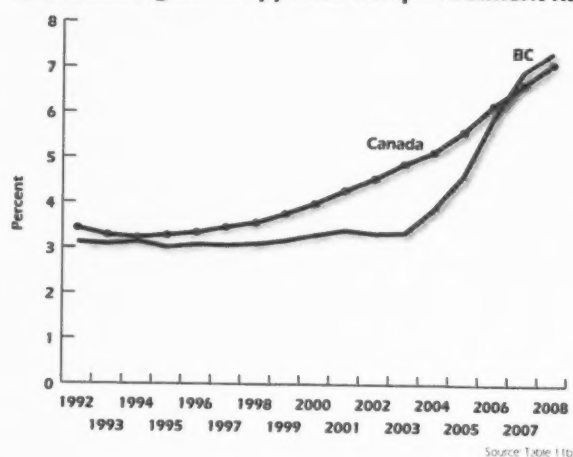
Aside from universities, a key component of the post-secondary system is registered

Appendix Figure 8: Female-Male University Enrolment Gap



apprenticeship training. In 2008, 53,103 British Columbia residents were enrolled in registered apprenticeship training (Table 11a). This was 7.4 percent of the population aged 18-29 (Table 11b). British Columbia's enrolment rate in registered apprenticeship training was below the Canadian average throughout most of the 1992-2007 period, but by 2007 the province's 6.9 percent enrolment rate was above the Canada-wide rate of 6.6 percent (Appendix Figure 9).

Appendix Figure 9: Apprenticeship Enrolment Rate



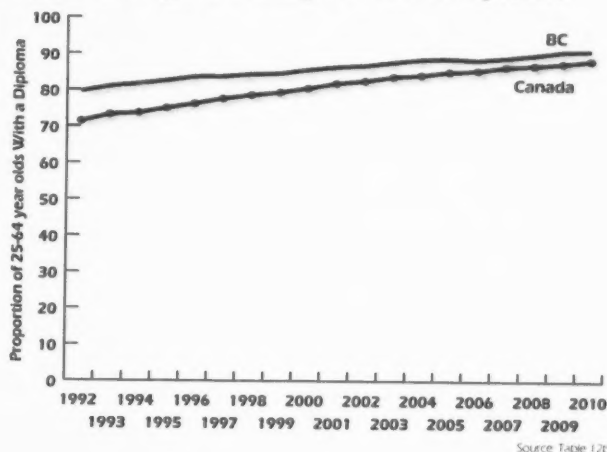
Appendix 3: Human Capital Outcomes in British Columbia

A. EDUCATIONAL ATTAINMENT

I. HIGH SCHOOL

In 2010, over 2.3 million British Columbia residents aged 25 to 64 had at least a high school diploma (Table 12a). This represented 91.1 percent of the population (25-64), the highest proportion in the country, ahead of Ontario (second at 90.1 percent) and Alberta (third at 89.3 percent). The national average was 88.4 percent. In British Columbia, the proportion increased 11.5 percentage points (or 14.5 percent) between 1992 and 2010; in Canada, it increased 17.0 percentage points (or 23.8 percent) over the same period (Appendix Figure 10). British Columbia experienced the smallest increase among the provinces; the largest were 34.6 percent and 34.3 percent in Prince Edward Island and Newfoundland and Labrador, respectively. Note, however, that British Columbia had the highest high school completion rate in the country in 1992, so the other provinces are all growing from a

Appendix Figure 10: High School Completers



lower starting point than British Columbia. Although Newfoundland and Labrador's high school completion rate grew more than twice as fast as British Columbia's over the period, Newfoundland and Labrador's 2010 rate was equal to British Columbia's 1994 rate.

It is also useful to put educational attainment in an international perspective. In 2007, the high school completion rate for people aged 25-64 was 85.2 percent in Canada and 88.7 percent in British Columbia (Table 12b). Canada's rate ranked third among OECD countries, behind only the Czech Republic at 91 percent and the United States at 88 percent (Statistics Canada, 2009). The OECD average was 70 percent. Breaking down the target population further reveals that 92 percent of British Columbia residents aged 25-34 have a high school diploma, compared to 91 percent in Canada as a whole and 79 percent across the OECD. Only South Korea (at 97 percent), the Czech Republic (at 94 percent), the Slovak Republic (at 94 percent) and Poland (at 92 percent) perform as well as British Columbia in terms of high school completion among residents aged 25-34. Thus, British Columbia is performing very well in terms of high school completion, particularly with respect to recent cohorts of high school-aged people.

There is not a large gender gap in the proportion of the population (25-64) with at least a high school diploma. In 2010, the proportion of females aged 25 to 64 with at least high school diploma was 92.0 percent, while the corresponding proportion of males was 90.2 percent (Table 12c). Canada's 2.5 percentage point gap was larger than British Columbia's 1.9 percentage point gap and the Canadian gap grew faster than British Columbia's between 1992 and 2010.

A gender gap also exists among 20-24-year-olds. Appendix Figure 11, based on 2006 Census data, provides estimates of the proportion of the population aged 20-24 without high school certification by sex and province in 2006.^{As} At the national level, the non-completion rate is higher for men than women: 16.1 percent versus 11.5 percent. This situation obtained in all provinces. The male non-completion rate in British Columbia was 12.0 percent, the lowest of all provinces. The female rate was 9.0 percent. Only Prince Edward Island enjoyed a lower non-completion rate for women.

Appendix Figure 11: High School Non-Completers, 2006

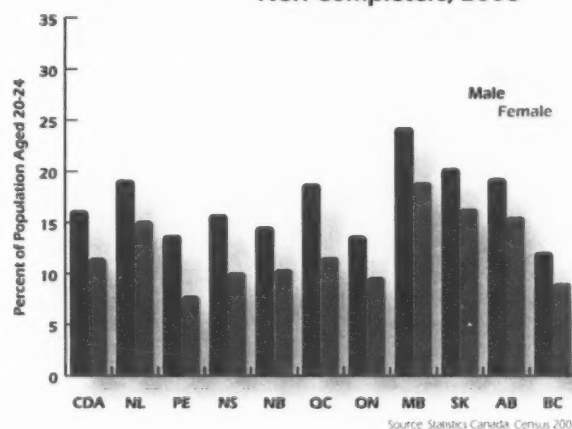


Table 1 in the report provides demographic information about high school non-completers in British Columbia. As a complement to that information, Appendix Table 1 contains data on the incidence of non-completion among various age groups and by gender.

Appendix Table 1: High School non-completion by Age and Sex, British Columbia, 2006

	Percentage of Population 18 and Over	Percentage of Non- completers 18 and Over	Incidence of non- completion
Both sexes, 18-64	82.1	63.4	12.6
Females	42.0	30.3	11.7
Males	40.1	33.1	13.4
Both sexes, 65 and over	17.8	36.4	33.3
Females	9.6	21.6	36.6
Males	8.2	14.8	29.4
Both sexes, 18-24	11.4	9.7	13.9
Females	5.7	4.5	12.9
Males	5.7	5.2	14.9
Both sexes, 25-34	15.5	8.8	9.2
Females	8.0	3.7	7.5
Males	7.5	5.1	10.9
Both sexes, 35-44	19.3	12.8	10.8
Females	9.9	5.8	9.4
Males	9.4	7.0	12.2
Both sexes, 45-54	20.3	16.1	12.9
Females	10.5	7.8	12.0
Males	9.7	8.3	13.9
Both sexes, 55-64	15.6	16.0	16.7
Females	7.9	8.6	17.7
Males	7.7	7.4	15.7

Note: Non-completers include only those who have neither high-school nor any post-secondary education. Incidence of non-completion is the proportion of the given subpopulation that has not completed high school. Source: Statistics Canada Census 2006, public use micro-data file.

The overall incidence of non-completion among females aged 18-64 is 11.7 percent, lower than that of males (13.4 percent). Unsurprisingly, the reverse is true among the cohort aged 65 and above. In this older cohort, the non-completion rate is 36.6 percent for females and 29.4 percent for males. The male non-completion rate exceeds the female for all age groups 45-54 and under, which reflects the well-known fact that high school non-completion has been a much larger problem among males than among girls in recent cohorts.

II. POST-SECONDARY

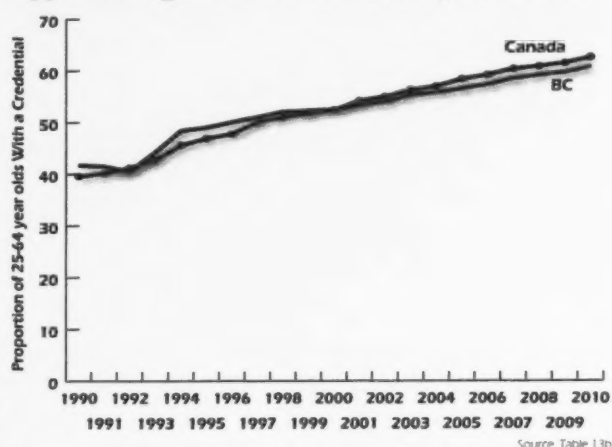
In 2010, over 1.5 million British Columbia residents aged 25-64 had a post-secondary certificate, degree, or diploma (Table 13a and Appendix Figure 12). This is the equivalent of 60.7 percent of the population aged 25 to 64, slightly below the Canadian average of 62.5 percent and fifth among the provinces. Compared to 1990, the proportion of the population (25-64) with a post-secondary

certificate, degree, or diploma has increased by 19.1 percentage points in British Columbia. This is lower than the national average (22.9 percentage points).

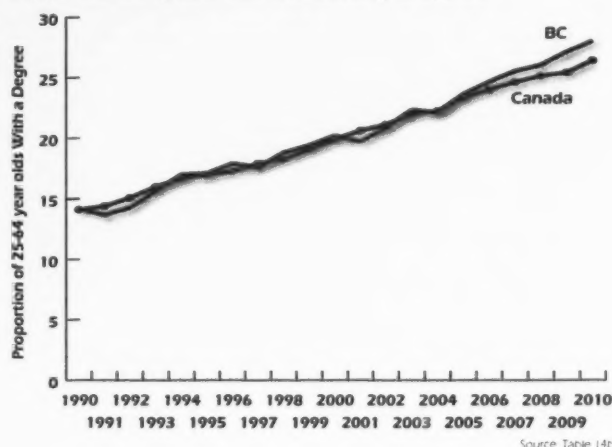
The proportion of the population (25-64) with a university degree in British Columbia closely tracked the Canadian average over the 1990-2010 period (Appendix Figure 13). The proportion increased by 13.8 percentage points in British Columbia over the period. This was the largest increase in the country. In Canada as a whole the increase was 12.4 percentage points.

The difference between males and females has changed significantly over time for this indicator. In British Columbia, the proportion of the population (25-64) with a university degree had been higher among males than among females through 2004 (Table 14c). Females caught up in 2005 and opened up a gap of roughly ten percent by 2010.

Appendix Figure 12: Post-Secondary Credential



Appendix Figure 13: University Degree

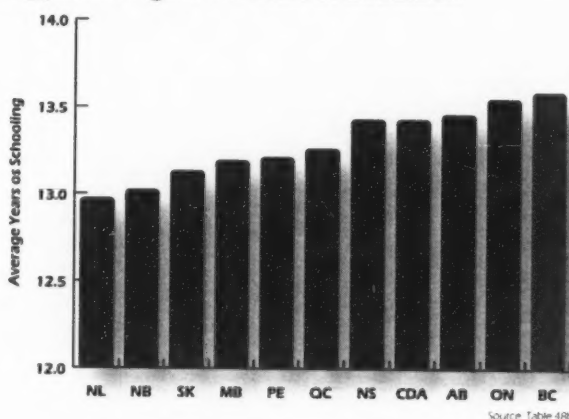


III. AVERAGE YEARS OF SCHOOLING

As a final indicator of educational attainment, we estimate the average number of years of formal schooling in the population aged 15 and over (Table 48b). This measure is commonly used as a measure of a society's human capital, particularly in the empirical literature on human capital and economic growth.¹⁶ As calculated by the CSLS, the average British Columbia resident in 2010 (aged 15 and over) had 13.6 years of formal education, slightly above the Canadian average of 13.4 years (Appendix Figure 14). British Columbia was tied with Ontario for the highest educational attainment among the provinces. However, there was not much variation across provinces; the lowest average attainment – Newfoundland and Labrador's 13.0 years – was only eight months lower than that of British Columbia and Ontario.

Average years of schooling grew 0.36 percent per year over the 1990-2010 period in British Columbia, slightly slower than the growth rate of 0.43 percent per year in Canada. Only Alberta (0.34 percent per year) had educational attainment growth slower than that of British Columbia. However, since British Columbia's average of 12.7 years of schooling in 1990 was the highest among the provinces, it makes sense that the other provinces would experience faster growth; since they had lower initial levels, they had more growth potential.

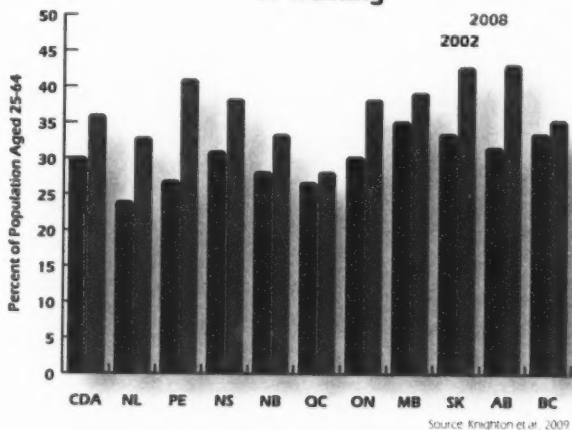
Appendix Figure 14: Years of Education



IV. LIFELONG LEARNING

In 2008, 35.5 percent of British Columbians aged 25-64 participated in job-related education or training (appendix Figure 15). This was below the Canadian average of 36.0 percent and was the fourth lowest among the provinces. British Columbia's education and training participation rate was up 1.9 percentage points from 33.6 percent in 2002 – the second smallest increase among the provinces, behind Quebec's 1.5 percentage-point increase. In Canada, the increase over the period was 5.9 percentage points.

Appendix Figure 15: Job-Related Education or Training



Participation in job-related education and training is not an area of long-standing disadvantage for British Columbia. In 2002, the province was above the Canadian average in terms of the proportion of the population participating in training (33.6 percent in British Columbia versus 30.1 percent in Canada). It remains to be seen whether or not British Columbia's below-average training participation rate will persist.

Knighton et al. (2009) does not provide a more detailed breakdown of trends in education and training participation within provinces. For Canada as a whole, participation was highest among younger cohorts (43 percent among those aged 25-34 and 42 percent among those aged 35 to 44, versus 29 percent among those aged 45-64). However, participation increased faster among

the middle and older cohorts than among the young cohort over the 2002-2008 period. In addition, participation in lifelong job-related education and training is positively associated with educational attainment; those with a post-secondary credential are more likely to obtain further education or training than those with only a high school education.

A recent assessment of British Columbia's overall workforce development system finds that the province performs well in terms of the "inputs, processes, and direct outputs of education, training, employment, labour market and HR programs" (Jothan, 2009). However, there is not much evidence that the workforce development system delivers the desired economic outcomes (enhanced productivity, enhanced competitiveness, etc.). The report suggests that workforce development should be based on a clear evaluative framework focused on key measurable economic outcomes rather than educational outputs.

B. SCORES ON SKILLS ASSESSMENT TESTS

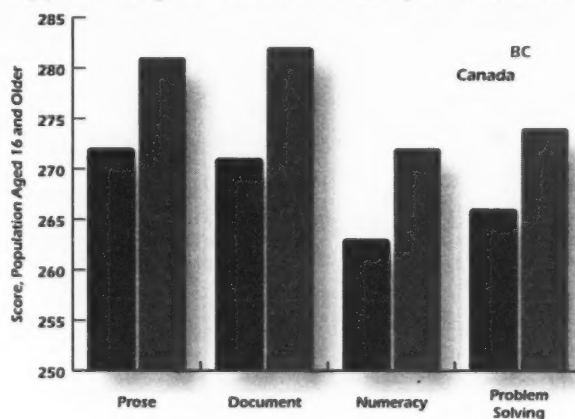
I. LITERACY

Figure 8 in the report shows the proportion of the population that achieved at least a Level 3 score on the International Adult Literacy and Skills Survey (IALSS) for Canada and the provinces. Level 3 (scores between 276 and 325) is considered to be the minimum desirable level of literacy.

An alternative measure of a society's literacy is the average IALSS score of its citizens. Appendix Figure 16 illustrates the average scores in the four competencies for British Columbia and Canada. British Columbia's scores exceed the national average in all four competencies.

Alberta, Saskatchewan and British Columbia hold the top three ranks among the provinces on all four domains measured in the IALSS (Table 16). Scores in these three provinces are separated by no more than two points or roughly one-third of one percent. Canada's average scores fell below the Level 3 threshold in all three of the domains measured. British Columbia's average scores met the Level 3 threshold in prose and document literacy but not in numeracy.^{A7}

Appendix Figure 16: IALSS Literacy Scores, 2003



Source: Table 16

Appendix 4: Populations with Unique Human Capital Challenges

A. HUMAN CAPITAL AMONG RECENT IMMIGRANTS

Figure 11 in the report shows that recent immigrants have both high levels of educational attainment and poor labour market outcomes (i.e. high unemployment rates and low median employment incomes) relative to non-immigrants. Appendix Tables 2 and 3 provide data to illustrate this paradox in greater detail.

Appendix Table 2 provides unemployment, employment, and labour force participation rates for the non-immigrant and immigrant populations in British Columbia, broken down by the highest level of education attained. We can make three key observations based on the table. First, the outcomes gap between non-immigrants and recent immigrants holds for all three outcomes measures and for all education levels. At every level of educational attainment, recent immigrants had higher unemployment, lower employment and lower participation rates than non-immigrants in 2006. Indeed, the outcomes of university-educated recent immigrants compare unfavourably to those of non-immigrants with only a high school education. Recent immigrants with a university education had an unemployment rate of 10.3 percent, while non-immigrants who did not pursue education beyond high school had an unemployment rate of only 6.2 percent.

Second, the size of the unemployment gap increases with educational attainment. Among people without high school, the recent immigrant unemployment rate of 14.7 percent was 3.1 percentage points (or 26.7 percent) higher than the non-immigrant rate of 11.6 percent. Among those with university degrees, the unemployment gap was 6.7 percentage points or 191.4 percent (3.5 percent unemployment for non-immigrants versus 10.2 percent for recent immigrants). This implies that the degree of skill underutilization is greatest among those who have the most to offer to British Columbia.

Third, the location of education matters. For college and university graduates, Appendix Table 2 shows the labour force activity statistics for those who were educated in Canada and those who received their credentials elsewhere in the world. Across the three indicators, outcomes for recent immigrants were generally worse for those educated outside of Canada than for those educated within Canada (with the surprising exception of the unemployment rate for those with a college, CEGEP, or other non-university credential as their highest level of attainment).^{A8} This explains at least part of the aggregate outcomes gap. Both immigrants and non-immigrants generally have better outcomes when they are educated in Canada, and since nearly all non-immigrants are educated in Canada while most immigrants were educated elsewhere, the overall average outcomes are better for non-immigrants.

Appendix Table 2: Labour Market Activity by Immigrant Status and Highest Educational Attainment, British Columbia, 2006

	Unemployment Rate			Employment Rate		
	Non-immigrant population	Total immigrant population	Recent immigrants (2001-006)	Non-immigrant population	Total immigrant population	Recent immigrants (2001-006)
No certificate, diploma or degree	11.6	9.6	14.7	40.5	32.0	34.2
High school certificate or equivalent	6.2	6.8	10.3	67.1	53.7	54.3
College, CEGEP or other non-university credential	4.6	4.7	8.6	73.5	63.6	63.6
Obtained inside Canada	4.5	4.8	10.3	73.7	72.7	67.8
Obtained outside Canada	6.5	4.6	8.0	62.5	54.2	62.4
University certificate or degree	3.5	5.8	10.2	77.1	69.4	67.6
Obtained inside Canada	3.5	4.9	9.1	77.7	75.2	77.0
Obtained outside Canada	3.6	6.4	10.3	68.7	66.1	66.8
	Participation Rate					
	Non-immigrant population	Total immigrant population	Recent immigrants (2001-006)			
No certificate, diploma or degree	45.8	35.4	40.0			
High school certificate or equivalent	71.5	57.6	60.5			
College, CEGEP or other non-university credential	77.0	66.8	69.6			
Obtained inside Canada	77.2	76.4	75.6			
Obtained outside Canada	66.8	56.8	67.8			
University certificate or degree	79.9	73.7	75.3			
Obtained inside Canada	80.6	79.1	84.8			
Obtained outside Canada	71.3	70.6	74.5			

Source: Statistics Canada Census 2006, Immigrant Status and Period of Immigration (9), Labour Force Activity (8), Highest Certificate, Diploma or Degree (7), Location of Study (16), Age Groups (9) and Sex (3) for the Population 15 Years and Over of Canada, Provinces, Territories, Census Metropolitan Areas and Census Agglomerations, 2006 Census - 20% Sample Data

Note, however, that this simple 'composition effect' does not explain the entire outcomes gap because British Columbia's recent immigrants face (in most cases) substantially higher unemployment and lower employment rates than non-immigrants even after conditioning on the location of education. Thus, other factors must also be important.

The same general patterns can be observed in Appendix Table 3, which exhibits median annual employment income data for non-immigrants and immigrants, by educational attainment level. Although we cannot distinguish between education inside and outside of Canada, the other two key points are clear in these data. Immigrants, especially recent ones, have substantially lower annual employment incomes than non-immigrants for any given level of educational attainment. In 2005, the non-immigrant earnings advantage in British Columbia increased with education, from 82.1 percent among those with less than a bachelor's degree to 148.8 percent among those with a credential beyond the bachelor level. Note that the same pattern held true for Canada in

Appendix Table 3: Median Employment Income by Immigrant Status and Educational Attainment, British Columbia and Canada, \$2005, 2000 and 2005

British Columbia	2000			2005		
	Non-immigrant population	Total immigrant population	Recent Immigrants (1996-2000)	Non-immigrant population	Total immigrant population	Recent Immigrants (2000-2004)
All Education Levels	29,173	26,941	16,889	26,974	23,693	16,293
Below Bachelor's	26,946	24,197	14,547	24,241	20,955	13,314
University Degree	45,834	35,172	22,528	42,965	31,474	20,971
Bachelor's Degree	41,709	33,327	22,429	38,762	29,179	20,381
Degree or Certificate Beyond Bachelor Level	56,990	43,730	25,616	53,347	36,389	21,443

Canada	2000			2005		
	Non-immigrant population	Total immigrant population	Recent Immigrants (1996-2000)	Non-immigrant population	Total immigrant population	Recent Immigrants (2000-2004)
All Education Levels	28,110	29,064	20,107	27,168	26,031	17,292
Below Bachelor's	25,103	26,896	16,178	23,982	23,079	13,909
University Degree	47,330	40,186	28,104	47,384	35,334	22,558
Bachelor's Degree	44,742	36,021	25,771	43,479	32,365	21,422
Degree or Certificate Beyond Bachelor Level	58,142	47,168	32,450	57,317	40,482	24,216

Source: Statistics Canada 2006 Census, Topic-based Cross-tabulations. Employment Income Statistics (4) in Constant (2005) Dollars, Work Activity in the Reference Year (3), Immigrant Status and Period of Immigration (10), Age Groups (5A), Highest Certificate, Diploma or Degree (5) and Sex (3) for the Population 15 Years and Over With Employment Income of Canada, Provinces, Territories, Census Metropolitan Areas and Census Agglomerations, 2000 and 2005 - 20% Sample Data.

2005, and for both Canada and British Columbia in 2000.

In Section V.A, we noted that research points to three main proximate causes of immigrants' poor labour market outcomes in Canada: a lack of Canadian work experience; the lack of recognition of foreign education and credentials; and language barriers. In turn, these proximate causes may be related to three underlying causes: low human capital (for a given level of educational attainment) due to the relatively low quality of educational institutions abroad; information problems and institutional deficiencies in Canada; and employer discrimination on the basis of race, religion, language, etc. In the two subsections that follow, we provide more detail on the academic literature underlying these claims.

I. PROXIMATE CAUSES OF IMMIGRANTS' POOR PERFORMANCE

Research suggests that low returns to foreign work experience are the biggest challenge facing recent immigrants in the Canadian labour market (Business Council, 2006b). The return to foreign work experience has declined among non-European immigrants in recent decades, and this explains about one third of the decline in recent immigrant earnings between the 1966 and 2000 Census cohorts (Aydemir and Skuterud, 2004). Schaaafsma and Sweetman (2001) find that there is virtually no return to foreign work experience in terms of labour earnings, and Oreopoulos (2009) finds that Canadian work experience more than doubles the probability that an immigrant's job application will lead to a job interview invitation (relative to an application that reports only foreign work experience but is otherwise identical).

The return to foreign credentials appears to be less important, although the evidence is mixed. Oreopoulos (2009) finds that the location of education does not affect the callback rates for immigrant job applications given that the applicant has Canadian work experience.⁴⁹ Aydemir and Skuterud (2004) find no significant difference in the returns to foreign and domestic educational credentials once other factors are controlled for, and Bonikowska et al. (2008) find only a small difference that is swamped by other factors. When years of education and level of educational attainment are included simultaneously in the analysis, evidence suggests that the return to years of foreign schooling is low while the marginal return to immigrants' foreign credentials per se is quite high (Ferrer and Riddell, 2008). This suggests that immigrants' credentials are recognized in the Canadian labour market, in the sense that an immigrant with a (foreign) university degree will earn much more than one with only a (foreign) high school diploma. However, it remains true that foreign education is considered less valuable than Canadian education.

Most statistical analyses of immigrants' labour market performance include immigrants' (usually self-reported) knowledge of an official language as a control variable. Schaaafsma and Sweetman (2001) show that having English as a mother tongue significantly improves the post-migration earnings profiles of immigrants who entered Canada in their 30s or older, but the effect is smaller

or non-existent for those who immigrated at younger ages. (Knowledge of French has no impact on immigrant earnings.) This suggests that knowledge of English is an important factor for adult immigrants. Aydemir and Skuterud (2004) find that immigrants who claimed to be English-speakers and who had English as a mother tongue enjoy a nine percent earnings advantage relative to those who claim English proficiency but had another mother tongue. In addition, there is clear evidence from other countries that the acquisition of the host-country language matters for immigrant labour market integration (Chiswick, 1991; Chiswick and Miller, 1995; Dustmann and Fabbri, 2003; Berman et al., 2003).

Overall, the evidence suggests that lack of Canadian work experience is the main challenge facing recent immigrants and that inadequate English language skill is also an important factor. Many studies find that the return to foreign credentials is a less significant issue, but those studies may conflate the impact of years of foreign education with that of credential acquisition itself (the so-called "sheepskin effect"). The results of Ferrer and Riddell (2008) suggest that low returns to foreign education are indeed a driver of recent immigrants' poor labour market outcomes in Canada.

II. UNDERLYING CAUSES OF IMMIGRANTS' POOR PERFORMANCE

There are several potential explanations for the low returns to the education and experience of recent immigrants in the Canadian labour market. It is necessary to understand these underlying factors in order to design policy interventions to address the sub-par outcomes of recent immigrants.

One possibility is that the immigrants are simply less skilled than non-immigrants with the same level of experience and educational attainment. Using detailed data on labour market activity, education and literacy scores from the International Adult Literacy and Skills Survey (IALSS), Bonikowska et al. (2008) show that 'cognitive skill,' as measured by the literacy and numeracy scores, is the main driver of the earnings gap between immigrants and non-immigrants in Canada. While it is true that the return to foreign education is lower than the return to Canadian education, the earnings gap would be dramatically reduced (and for some sub-groups, eliminated altogether or turned into an immigrant earnings advantage) if immigrants had the same measured cognitive abilities as non-immigrants with equal educational attainment.^{A10} This may reflect the lower quality of educational institutions or lower educational standards in countries such as China, India and Pakistan, from which a large share of Canada's immigrants originate.

The results of Ferrer and Riddell (2008) are consistent with this story. An immigrant with a foreign master's degree may well possess more human capital than one with a foreign high school diploma, but his or her level of human capital is still likely to be lower than that of a Canadian with the same number of years of education.

An alternative underlying explanation is that the immigrants' human capital is on par with that of Canadians, but that Canadian employers and regulators have inadequate information for determining that equivalence. There is a potential role for government in addressing this information problem, but the common claim that immigrants' foreign credentials are not recognized by Canadian professional regulators suggests that the government may not be succeeding in this role.

To determine whether or not they are qualified to work in their profession in Canada, newcomers must deal with the regulatory body responsible for their intended occupation in their intended province of residence.^{A11} It is the responsibility of the immigrant to initiate this process. There is no formal federal or provincial body to carry out credential assessments, such as they have in Australia and New Zealand (Business Council, 2007). (British Columbia does have the independent International Credential Evaluation Service, but employers and regulators do not have to accept its assessments.) The process is complicated by the fact that immigration policy is administered by the federal government while professions are regulated by provincial governments or by occupational licensing bodies given regulatory authority by the provinces. The federal government admits immigrants on the basis of a points system that assigns points for educational attainment, irrespective of whether or not the immigrant's educational credentials are likely to be recognized by the relevant regulatory body overseeing his or her intended profession.^{A12} Given this lack of interjurisdictional cohesiveness, it is unlikely that the current institutional arrangement succeeds in providing immigrants with the information and certainty they require in order to achieve economic integration post-migration.

A final underlying explanation is discrimination. There is mixed evidence as to whether employer discrimination plays a substantial role in the Canadian labour market. Bonikowska et al. (2008) find that the estimated return to cognitive skill is not lower for immigrants than for non-immigrants in Canada, and they take this as evidence against the proposition that employer discrimination plays a role in the earnings gap. On the other hand, Oreopoulos (2009) sent over 6,000 resumes to employers in Toronto and found that resumes listing Canadian education and experience but non-European (i.e. Chinese, Pakistani or Indian) names elicited 40 per cent fewer callbacks from employers than did identical resumes with 'white-sounding' names. Henry and Ginzberg (1985) called 237 Toronto employers and asked about job openings using Canadian, Slavic, West Indian or Indo-Pakistani accents. Employers responded in the affirmative 85 per cent of the time when asked in a typical Canadian accent, but less than 50 per cent of the time when asked in a West Indian or Indo-Pakistani accent. These results suggest that discrimination may be a real barrier for immigrants in Canada. Indeed, Owen and Lowe (2008) report that 70 per cent of visible minorities in Canada believe that they have experienced racial discrimination in the Canadian workplace.

B. HUMAN CAPITAL AMONG ABORIGINAL PEOPLE

Figure 12 in the report illustrates the gaps between the high school completion rates of non-Aboriginals and Aboriginal people living both on- and off-reserve. Appendix Table 4 provides the data underlying those comparisons. In British Columbia and across Canada, Aboriginals who live off-reserve are more likely to have completed high school than those living on-reserve. The proportion of British Columbians aged 20-64 who had a high school diploma (or equivalent) in 2006 was 73.6 among Aboriginals living off-reserve and just 56.5 percent for those living on-reserve. The off-reserve rate was 17.1 percentage points (or 30.3 percent) higher than the on-reserve rate. Aboriginals both on- and off-reserve were less likely than non-Aboriginals to have completed high school; the completion rate for non-Aboriginals was 88.7 percent.

The same patterns hold for Canada as a whole. The completion rate for on-reserve Aboriginals was 48.4 percent – 21.8 percentage points (or 45.0 percent) lower than the off-reserve Aboriginals' rate of 70.2 percent. The Canada-wide completion rate for non-Aboriginals was 85.4 percent.

Appendix Table 4: High School Completion by Age, Ethnicity, and Reserve Status, British Columbia and Canada, 2006

British Columbia						
Age Group	High School Completion Rate			Gap		
	Non-Aboriginals	Aboriginals On-Reserve	Aboriginals Off-Reserve	Off-Reserve less On-Reserve	Non-Aboriginal less On-Reserve	Non-Aboriginal less Off-Reserve
20-64	88.7	56.5	73.6	17.1	32.2	15.1
20-24	90.8	53.4	72.9	19.5	37.3	17.9
25-34	91.6	57.1	76.0	19.0	34.6	15.6
35-44	90.4	60.9	75.6	14.6	29.5	14.8
45-54	87.7	56.3	72.3	16.1	31.4	15.3
55-64	84.0	51.2	68.1	16.9	32.8	15.9

Canada						
Age Group	High School Completion Rate			Gap		
	Non-Aboriginals	Aboriginals On-Reserve	Aboriginals Off-Reserve	Off-Reserve less On-Reserve	Non-Aboriginal less On-Reserve	Non-Aboriginal less Off-Reserve
20-64	85.4	48.4	70.2	21.8	37.0	15.2
20-24	87.5	39.0	67.0	28.0	48.4	20.5
25-34	90.0	49.3	74.3	25.0	40.7	15.7
35-44	88.1	52.8	73.0	20.2	35.4	15.1
45-54	84.1	51.9	70.0	18.1	32.3	14.2
55-64	77.6	43.6	60.8	17.2	34.0	16.8

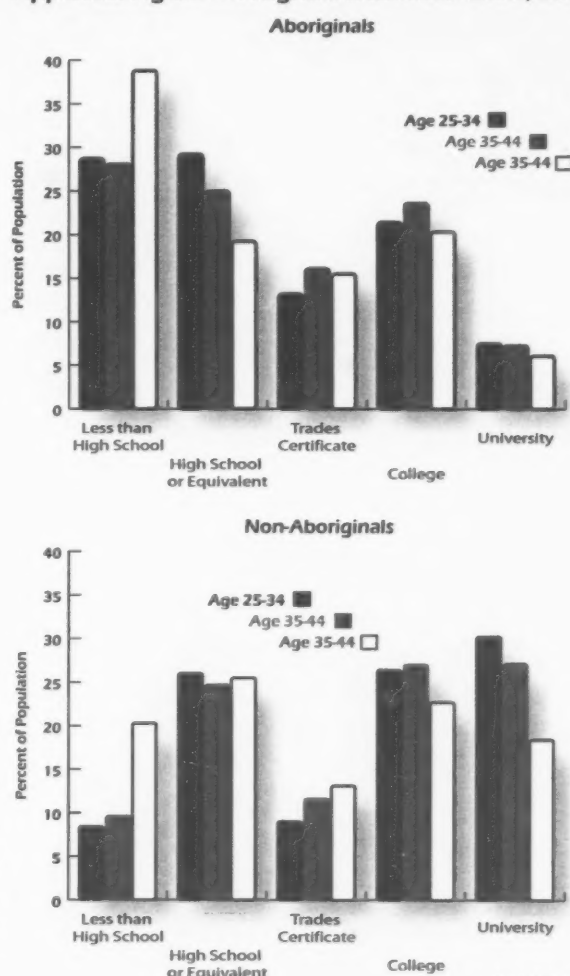
Source: Statistics Canada, 2006 Census.

Appendix Table 4 illustrates many important patterns. The pattern of high school completion rates over the lifecycle is similar across the Aboriginal and non-Aboriginal populations and does not differ qualitatively between British Columbia and Canada. Typically, the completion rate is slightly higher for persons aged 25-34 and 35-44 than for persons aged 20-24, and the rates for the older groups (45-54 and 55-64) are the lowest. The only exception (but a very significant one) is that the completion rate among the Canada-wide population of on-reserve Aboriginals is actually lower for the young cohort (20-24) than for the older cohorts. This suggests that on-reserve education systems across Canada have been particularly unsuccessful in fostering high school completion over the past five to ten years. British Columbia's reserves have bested the national average by achieving above-average completion rates in every age cohort, and the completion rate among the province's on-reserve population of 20-24-year-olds is higher than the rate among the 55-64-year-olds.

British Columbia also has a substantially lower gap between the educational performance of on-reserve and off-reserve Aboriginals than Canada as a whole. In Canada, the gap in educational outcomes between on- and off-reserve Aboriginals is much larger for young people than for older people. Relative to the Canadian average, British Columbia's outcomes gap is smaller in magnitude for every age group and is more stable across age groups.

In addition to basic education, it is important to examine the degree to which Aboriginals are acquiring higher levels of education. Appendix Figure 17 illustrates the proportions of the Aboriginal and non-Aboriginal populations of British Columbia that have achieved the indicated levels of education. Young cohorts are attaining high school and post-secondary education at higher rates than previous generations among both Aboriginals and non-Aboriginals. This is a positive trend. However, educational attainment is increasing faster for non-Aboriginals than for Aboriginals. This implies that the post-secondary education gap between Aboriginals and non-Aboriginals is increasing over time. The same trends hold for Canada as a whole (Table 36).

Appendix Figure 17: Highest Education Level, 2006



In Section V.B, it is noted that the British Columbia school districts that perform best in terms of Aboriginal education tend to have more Aboriginal teachers than the poorly performing districts. The academic literature provides additional support for this recommendation, and we briefly summarize it below.

Research generally supports the notion that the demographic characteristics of teachers (specifically race and gender) influence teacher-student dynamics in the classroom and affect student educational outcomes. Dee (2005) summarizes a number of mechanisms that might explain these effects. These include 'role model' effects, whereby the presence of a teacher with certain demographic characteristics raises the motivation and confidence of students with similar characteristics; the 'stereotype threat' effect, whereby students feel that they may be subject to negative stereotyping (e.g. black student with a white teacher) and perform poorly due to their anxiety about confirming that stereotype; and 'unintended bias' effects, whereby the demographic characteristics of students influence the teacher's behaviour toward and expectations for the students. It is also possible that teachers who are members of minority or disadvantaged groups are better able to communicate course material to students in a manner that reflects their particular experiences and values.

Dee (2005) illustrates that race and gender differences between teachers and students have a large negative effect on teachers' expectations for students' performance in the United States. This is consistent with much of the literature on the issue (Ferguson, 1998; Irvine, 1988), although there are studies that did not find such effects (Erhenberg et al., 1995). In an experiment involving the random assignment of students to teachers with similar or dissimilar racial characteristics, Dee (2004) shows that having a racially similar teacher led to increased test scores. Irvine (1990) finds that white teachers provide black students with less support and positive feedback than black teachers, and Steele and Aronson (1995) show that stereotype threat has a substantial impact on student outcomes.

We are aware of no studies that examine these issues in the context of Aboriginal teachers and students in Canada. Nevertheless, the existing evidence from other jurisdictions, combined with the observation that the best performing school districts in British Columbia have more Aboriginal teachers, provides a strong rationale for the importance of Aboriginal teachers.

I. DATA ON MORE AND LESS SUCCESSFUL SCHOOL DISTRICTS IDENTIFIED IN RICHARDS ET. AL. (2008)

Appendix Tables 5 through 8 present results for Aboriginal and non-Aboriginal students in BC, and for two high-performing and two low-performing districts identified in Richards, Hove and Afolabi (2008). There is considerable variation in results by district and although the data

Appendix Table 5: Grade 4 PSA Performance, 2010

	Reading	Writing	Numeracy	Reading	Writing	Numeracy	Reading	Writing	Numeracy	Reading	Writing	Numeracy
<i>Aboriginal Students</i>	Performance Level Unknown			Not Yet Meeting			Meeting			Exceeding		
SD A	10	14	11	20	17	20	60	63	59	10	6	10
SD B	9	9	4	39	28	39	48	63	52	4	0	4
BC	21	23	21	28	23	34	46	52	42	5	2	3
SD C	9	9	9	50	22	50	38	69	41	3	0	0
SD D	23	26	28	28	28	38	47	47	32	2	0	2
<i>All Students</i>	Performance Level Unknown			Not Yet Meeting			Meeting			Exceeding		
SD A	8	10	8	15	13	15	61	69	63	16	9	14
SD B	14	15	14	15	16	19	60	67	57	10	2	10
BC	16	18	17	16	13	20	56	63	54	12	6	9
SD C	16	15	16	17	8	15	53	72	58	14	4	12
SD D	8	11	10	14	15	23	63	70	58	15	3	8

Sources: BC Progress Board; BC Ministry of Education

presented here are more recent than those used in the aforementioned study, the two high-performing districts continue to do better than average and the low-performing districts continue to come in below average.

On grade four Foundation Skill Assessment (FSA) results proportions of Aboriginal students in School Districts A and B that met expectations were well above the BC average for Aboriginal students and close to the average for all students. In addition, Aboriginal students in School District A exceeded expectations at the provincial average for all students. Not yet meeting results were mixed and the proportion of students with unknown performance (i.e., did not take the test) were lower in both high performing and in one low performing districts.

Appendix Table 6: Grade 7 PSA Performance, 2010

	Reading	Writing	Numeracy	Reading	Writing	Numeracy	Reading	Writing	Numeracy	Reading	Writing	Numeracy
<i>Aboriginal Students</i>	Performance Level Unknown			Not Yet Meeting			Meeting			Exceeding		
SD A	10	14	12	22	11	29	56	66	56	11	8	3
SD B	23	23	31	39	39	43	34	39	23	4	0	3
BC	22	25	24	31	25	38	42	47	37	4	2	2
SD C	21	44	29	31	25	37	27	29	35	2	2	0
SD D	7	7	10	46	32	46	41	59	44	5	2	0
<i>All Students</i>	Performance Level Unknown			Not Yet Meeting			Meeting			Exceeding		
SD A	7	8	7	20	11	19	61	70	65	12	11	8
SD B	13	14	15	25	25	34	55	60	50	6	1	2
BC	17	19	17	18	13	20	54	62	54	11	6	9
SD C	26	29	27	14	7	19	51	61	50	10	3	4
SD D	4	6	6	18	11	25	65	79	64	12	5	4

Sources: BC Progress Board; BC Ministry of Education

Aboriginal students in School District A have strong results on Grade seven FSAs as well. Their meet and exceed ratios are generally at or above the ratios for all students, their not meeting ratios are close to those for all students and their unknown ratios are well below those for all students. Aboriginal students in School District C generally underperform. However, results in School Districts B and D do not fit their respective high- and low-performing designations. Results for successful transitions to a higher grade do not show a clear distinction between the two high- and two low-performing districts although School District A has a strong showing and School District C has a weak one.

Appendix Table 7: Six-Year Completion and Graduation Rates, 2009/10, percent

<i>Aboriginal Students</i>	<i>Six-Year Completion</i>	<i>Eligible Grade 12 Graduation</i>	<i>First-Time Graduation</i>
SD A	61.1	96	80
SD B	60.2	97	70
BC	50.4	89	59
SD C	28.2	75	24
SD D	39.4	83	58
<i>All Students</i>	<i>Six-Year Completion</i>	<i>Eligible Grade 12 Graduation</i>	<i>First-Time Graduation</i>
SD A	85.9	97	87
SD B	84.4	96	86
BC	79.7	95	80
SD C	66.6	94	60
SD D	72.7	94	86

Sources: BC Progress Board; BC Ministry of Education

The six-year completion rate is much better than average in high-performing districts and much worse in low-performing districts. Results for all students show the same general pattern but differences from the provincial average are considerably larger for Aboriginal students.

All four districts report rates for eligible grade 12 graduation for all students near the provincial average. Rates for Aboriginal students are well above average in the two high-performing districts and well below average in the low-performing ones. Indeed, Aboriginal rates are slightly above to those for all students in School Districts A and B.

Appendix Table 8: Successful Transition to a Higher Grade, 2008/09, percent

<i>Aboriginal Students</i>	<i>Grade 6 Students</i>	<i>Grade 7 Students</i>	<i>Grade 8 Students</i>	<i>Grade 9 Students</i>	<i>Grade 10 Students</i>	<i>Grade 11 Students</i>
SD A	98	97	97	93	84	75
SD B	96	96	95	94	82	65
BC	97	96	93	89	81	69
SD C	100	91	98	85	65	45
SD D	98	96	98	90	92	66
<i>All Students</i>	<i>Grade 6 Students</i>	<i>Grade 7 Students</i>	<i>Grade 8 Students</i>	<i>Grade 9 Students</i>	<i>Grade 10 Students</i>	<i>Grade 11 Students</i>
SD A	96	97	97	97	93	88
SD B	98	98	97	96	94	81
BC	97	97	96	95	92	85
SD C	99	98	99	96	88	75
SD D	98	98	97	95	92	79

Sources: BC Progress Board; BC Ministry of Education

Both high-performing districts beat the Aboriginal average on first-time Grade 12 graduation. However, one of the low-performers tied the average and the other low-performer, which was well below average, also had an all student ratio well below the average.

Appendix 5: Summary of British Columbia's Human Capital Performance

Appendix Table 9 provides an overview of British Columbia's performance in terms of twenty-five key indicators of human capital development. These indicators were chosen to represent a comprehensive summary of the dimensions of human capital performance discussed in this report, based on the authors' assessment of the importance of various indicators. For each indicator, we assign to British Columbia a subjective rating – well above average, above average, average, below average, and well below average – based on its performance relative to the Canadian average, other provinces, and (where applicable) other OECD countries.

According to our subjective rating, British Columbia rated well above average in five indicators, above average in 12, average in five, below average in two, and well-below average in one. British Columbia was rated above average or well above average in 68 percent of the indicators (17 of 25). The province's performance was particularly good in five areas. In the International Adult Literacy and Skills Survey, the proportion of British Columbians whose scores were above Level 3 (the survey's benchmark for a 'desirable' literacy level) was at least 14 percent above the Canadian average in all four domains of literacy. British Columbia's advantage was 14.7 percent in prose literacy, 16.6 percent in document comprehension, 14.3 percent in numeracy, and 24.5 percent in problem solving. In every domain, British Columbia's score on this indicator was on par with those of Alberta and Saskatchewan and well ahead of all the other provinces. Finally, British Columbia's high school drop-out rate was 30.2 percent below the national average and was the lowest among the provinces.

It is noteworthy that the on-reserve Aboriginal high school completion rate was 16.6 percent higher in British Columbia than in Canada in 2006, but it was still well below the rate for non-Aboriginals. (Of course, the provincial averages mask substantial variation across school districts, as discussed in Section VI.B in the main report.) In addition, the unemployment rate among recent immigrants with post-secondary education was 2.1 times the rate for the general population of persons with post-secondary education in British Columbia. This gap was smaller in British Columbia than in Canada, but it is still very high.

Even in the context of British Columbia's strong overall performance, there is room for improvements that would help enhance the province's productivity. British Columbia's performance was sub-par in three indicators, and very poor in one of those. The province's graduate school enrolment rate was 2.6 percent in 2008, 16.6 percent below the national average of 3.1 percent. This is especially worrying because the development of advanced human capital is important for productivity growth in countries, like Canada, that are close to the global technological frontier (see Section VI.C in the main report).

In addition, the proportion of British Columbians (aged 25-64) with a post-secondary degree is slightly below the Canadian average. British Columbia students scored slightly below the Canadian average in mathematics on the PISA tests, and the proportion of the population aged 25-64 engaged in job-related education or training was slightly below the Canadian average.

We also ranked the provinces according to each of the 25 indicators and computed the average rank of each province. British Columbia's average rank of 3.4 (out of 10) was second-highest among the provinces, behind Alberta with an average rank of 3.0 and ahead of third place Ontario at 4.1.

Overall, British Columbia's human capital performance is strong. The province is above average along most dimensions. There are a few areas in which the province is lagging behind the rest of the country, some of which are more amenable to policy than others. Where possible, government and other stakeholders should focus on improving the province's few areas of weakness while maintaining its altogether strong performance.

Appendix Table 9: Notes

* See Note 3.

1. The subjective rating is an assessment of British Columbia's performance in a given indicator, relative to the Canadian average and, where applicable, to the performances of other provinces and countries. The rating scheme is as follows:

- ++ means that British Columbia's performance is well above average.
- + means that British Columbia's performance is above average.
- "Average" means that British Columbia's performance is average.
- means that British Columbia's performance is below average.
- means that British Columbia's performance is well below average.

2. The values given for each indicator are for the most recent year for which data are available. This is usually 2008, but in some cases it is 2007, 2005 or 2003. See the source data in the tables.

3. A higher value represents a lower rank for two indicators: the high school drop-out rate and the unemployment Rate of recent immigrants with post-secondary education relative to the overall unemployment rate for persons with post secondary education. These are denoted with an asterisk (*) in the table above. For all other indicators, a higher value indicates better performance.

4. The two indicators discussed in Note 3 are treated differently than the others in the construction of the average BC-to-Canada ratio. For example, the BC high school drop-out rate is 74.3 percent of the Canadian average. This indicates that BC is performing 25.7 percent better than Canada (that is, $100 - 74.3$). When computing the overall average ratio for the set of indicators, we therefore use 125.7 for the high school drop-out rate, not 74.3. We treat the immigrant-non-immigrant unemployment rate gap in the same way. This adjustment is necessary to account for the fact that a higher value indicates a worse score for these two indicators.

5. The rank for British Columbia among the provinces is always based on the data in the most recent year for which data are available. Data are available for all ten provinces for all indicators except for two: real capital investment in the educational services industry per person aged 5-24, and investment in the educational services industry as a share of total investment. In those cases, BC is ranked out of 7 rather than 10. The overall average rank, however, is assumed to be out of 10.

6. The values of the indicators are rounded to (at most) one decimal place, but the BC-Canada ratios are computed based on unrounded values.

Appendix Table 9: Summary Indicators of BC's Human Capital Performance

<i>Indicator</i>	<i>BC</i>	<i>Canada</i>	<i>BC to Canada (percent)</i>	<i>Subjective Rating</i>	<i>BC's Rank</i>
<i>Physical Investment in Educational Services Industry</i>					
1. Real investment per person aged 5-24	1,013	947	107.0	+	(2/7)
2. Real capital stock per person aged 5-24	8,060	7,342	109.8	+	(3/10)
3. Share of total, %	4.0	3.7	106.3	+	(4/7)
<i>Government Educational Expenditure</i>					
4. Provincial-local as a share of GDP, %	6.2	6.0	102.7	Average	(6/10)
5. Per-student, public K-12 schools	9,597	9,873	97.2	Average	(6/10)
6. Per-student, post-secondary	21,802	21,345	102.1	Average	(7/10)
<i>Student High-School Performance</i>					
7. Mean PISA score, Science	535	529	101.1	+	(2/10)
8. Mean PISA score, Reading	525	524	100.2	+	(3/10)
9. Mean PISA score, Mathematics	523	527	99.2	Average	(4/10)
*10. High school drop-out rate	6.2	8.9	69.8	++	(1/10)
11. High school completion rate	91.1	88.4	103.1	+	(1/10)
12. On-reserve Aboriginal high school complete	56.5	48.4	116.6	+	(4/10)
<i>Adult Literacy Standardized Tests, at least Level 3 IALSS</i>					
13. Prose literacy	60.1	52.4	114.7	++	(2/10)
14. Document literacy	59.7	51.2	116.6	++	(2/10)
15. Numeracy	51.2	44.8	114.3	++	(2/10)
16. Problem solving	34.5	27.7	124.5	++	(1/10)
<i>Post-Secondary</i>					
17. Undergraduate enrolment	26.1	26.4	98.6	Average	(6/10)
18. Graduate enrolment	2.6	3.1	84.4	--	(5/10)
19. Apprenticeship enrolment	7.4	7.1	103.6	+	(3/10)
20. Post-secondary degree or certificate	60.7	62.5	97.2	-	(5/10)
21. University degree	28.0	26.4	106.0	+	(2/10)
22. University degree above bachelor's	9.1	8.3	110.3	+	(2/10)
23. Average number of years of education	13.6	13.4	101.2	+	(1/10)
24. Job-related education or training	35.5	36.0	98.6	-	(7/10)
<i>Performance of Recent Immigrants with Post-Secondary Education</i>					
*25. Unemployment relative to overall population	212.8	233.3	<u>91.2</u>	+	<u>(7/10)</u>
Average			103.1		3.4/10

Appendix Table 9: Detailed Indicator Descriptions

1. Real capital investment in the educational services industry, per person aged 5-24 (2002 chained dollars)
2. Total real capital stock in the educational services industry, per person aged 5-24 (2002 chained dollars)
3. Investment in the educational services industry as a share of total investment (percent)
4. Total provincial and local government expenditure on education as a share of nominal GDP (percent)
5. Per-student government expenditure on education in public elementary and secondary schools (current \$)
6. Per-student provincial and local government expenditure on education at the post-secondary level (current \$)
7. Mean score (among students aged 15) on the Program for International Student Assessment test, Science
8. Mean score (among students aged 15) on the Program for International Student Assessment test, Reading
9. Mean score (among students aged 15) on the Program for International Student Assessment test, Mathematics
*10. High school drop-out rate (percent of persons aged 20-24 without a high school diploma and not attending school)
11. High school completion rate (percent of population aged 25-64)
12. On-reserve Aboriginal high school completion rate (percent of population aged 20-64)
13. Proportion of the population (aged 16 and over) with at least a Level 3 literacy score in the International Adult Literacy and Skills Survey (percent), Prose literacy
14. Proportion of the population (aged 16 and over) with at least a Level 3 literacy score in the International Adult Literacy and Skills Survey (percent), Document literacy
15. Proportion of the population (aged 16 and over) with at least a Level 3 literacy score in the International Adult Literacy and Skills Survey (percent), Numeracy
16. Proportion of the population (aged 16 and over) with at least a Level 3 literacy score in the International Adult Literacy and Skills Survey (percent), Problem solving
17. Proportion of the population aged 18-29 enrolled in community college or in a university undergraduate program (percent)
18. Graduate university enrolment rate (percent of population aged 18-29)
19. Registered apprenticeship enrolment rate (percent of population aged 18-29)
20. Proportion of the population aged 25-64 with a post-secondary degree or certificate (percent)
21. Proportion of the population aged 25-64 with a university degree (percent)
22. Proportion of the population aged 25-64 with a university degree above a bachelor's degree (percent)
23. Average Number of Years of Education
24. Proportion of the population aged 25-64 engaged in job-related education or training (percent)
*25. Unemployment Rate of recent immigrants with post-secondary education relative to the overall unemployment rate for persons with post secondary education (percent)

Appendix Endnotes

A1 Labour force participants are those who are either employed or looking for a job.

A2 See, for example, Katz and Goldin (2008), Lemieux (2006), Bound and Johnson (1992), and Katz and Murphy (1992).

A3 The Gini coefficient is the most common measure of income inequality. A Gini value of 0 indicates a state of perfect equality, in which all members of the population have equal income. A Gini value of 1 corresponds to a situation in which one person has all the income and everyone else has zero. Obviously, neither of these extremes is observed in the real world. For practical purposes, Gini coefficients for advanced countries tend to range between 0.20 and 0.45, depending on the income measure being used. British Columbia's Gini coefficient of 0.40 is relatively high. See Osberg and Sharpe (2009a; 2009b).

A4 Of course, some university students are not between the ages of 18 and 29. As in the case of primary and secondary school, Statistics Canada does not provide data on enrolment rates. The enrolment rates we provide are apt approximations under the assumption that most post-secondary students are in the 18-29 age range. This point applies to the enrolment rate estimates we discuss throughout this section.

A5 Note that these are not strictly speaking drop-out rates according to the Statistics Canada definition described in the report, since some of the persons without a high school diploma may currently be in school.

A6 In the international development context, the standard source for country-level data on average years of education is Barro and Lee (2000).

A7 The IALSS threshold has yet to be defined for the category "problem solving."

A8 For college-educated recent immigrants, the unemployment rate was actually higher for those educated within Canada (10.3 percent) than for those educated elsewhere (8.0 percent). This is not true for Canada as a whole; the national unemployment rate among college-educated recent immigrants is 10.5 percent for those educated in Canada and 11.5 percent for those educated elsewhere. It is not clear why British Columbia exhibits the opposite pattern.

A9 Oreopoulos' study does not provide results for the (perhaps rare) case of immigrants with Canadian education but only foreign work experience. Thus, we cannot compare returns to Canadian and foreign education given only foreign work experience.

A10 The authors stress the fact that their measure of cognitive ability captures immigrants' skills as measured by a test administered in English or French. Most immigrants do not have English or French as a mother tongue, and it is likely that this contributes to their lower scores. Since English is the dominant language of commerce in British Columbia, the IALSS scores should be viewed as measures of immigrants' level of 'usable skill' in the provincial economy, not as a measure of their inherent cognitive ability. This could be one mechanism by which language barriers contribute to the poor labour market outcomes of recent immigrants.

A11 In Canada, there are more than 50 regulated professions governed by over 400 regulatory and licensing bodies (Becklumb and Elgersma, 2008). Regulated professions constitute 15 to 20 percent of the Canadian labour force, but a much higher proportion of the intended professions of recent immigrants. In 2006, 41 percent of university-educated immigrants in Canada had studied in fields that normally lead to employment in a regulated occupation (Zietsma, 2010).

A12 Contrast this with New Zealand, which carries out a credential assessment early in the immigration process and awards immigration points on the basis of New Zealand-equivalent educational attainment (Business Council, 2007).

Appendix 6: Persons Interviewed for the BC Human Capital Report

- 1) Brent Sauder, Director, Strategic Partnerships, Research and Partnerships Office, UBC Sustainability Initiative, University of British Columbia
- 2) Frank Eichgruen, Program Manager, Policy, Planning & Reporting, Western Economic Diversification
- 3) Ruth Wittenberg, Assistant Deputy Minister, BC Ministry of Advanced Education & Labour Market Development
- 4) Jim Brookes, MITACS
- 5) Jim Reichert, British Columbia Institute of Technology
- 6) Tim McEwan, Initiatives Prince George
- 7) BC Chamber of Commerce officials
- 8) University of Northern British Columbia officials
- 9) Ken Peacock and Jock Finlayson, BCBC
- 10) Don Avison, President, BC Research Universities Council
- 11) Martin Wright, Senior Director, the Ministry of Children and Family
- 12) Paige MacFarlane, ADM with the Ministry of Education, Partnerships and Planning Division
- 13) Casey Sheridan, President, Nicola Valley Institute of Technology
- 14) Rob Watts, the Provincial Director for Corrections with the Ministry of Public Safety and Solicitor General and Carrie McCulley, Offender Programs Manager with Corrections
- 15) Arnie Leon, Delta School District
- 16) Ted Cadwallader, Ministry of Education
- 17) Perry Smith, Abbotsford School District
- 18) Gayle Bedard, Surrey School District

Appendix 7: Board Members, Staff & Advisory Group Members

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